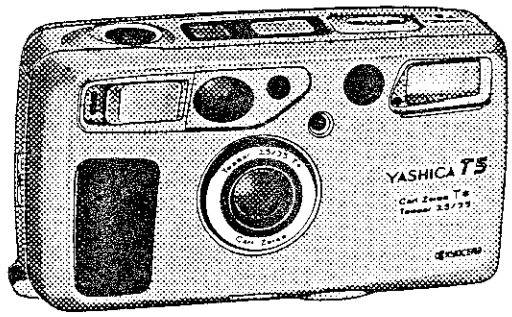
KYOCERA

NO.	419-01-50-RA3CP01

KYOCERA
T PROOF
YASHICA
T5 / T5D
YASHICA
T4 Super / T4 Super D

Repair Manual



Approved by	Made by
風 '95.12.22 嵐	氏 '96.12.22 家

KYOCERA CORPORATION

Optical Equipment Group
Service Dept. 3CP 951222

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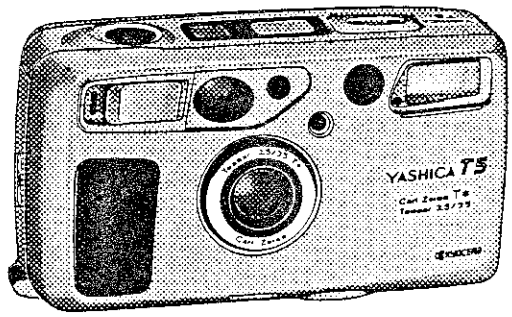

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A. DESCRIPTION OF MECHANISM

Features

This is a lightweight, ultra-thin and weatherproof 35mm camera with a New Angle Scope on the top and superb image quality with a Carl Zeiss Tessar T* lens.

<< LENS >>

- Carl Zeiss Tessar T* 35 mm F 3.5 built-in
- Possible close-up shooting to 0.35m

<< VIEWFINDER >>

- A New Angle Scope (NA Scope) on the top of camera enables snap-shooting versatility at unconventional angles.

Low-angle shots --- Look into the viewfinder from the top, and low-angle shots at eye-level with subjects is easy.

Waist-level shots --- Hold the camera at waist-level, and subjects can be shot at total ease and more natural result.

High-angle shots --- Hold the camera over the head and look into the viewfinder from below, and take pictures over crowds of people.

On the Wall shots -- In a limited place for stance, placing the camera and looking into the viewfinder from top can save the distance to subjects.

<< AF >>

- High-precision (3-beam infrared) active Multi-AF system

<< AE >>

- 2-segment SPD device, automatic backlight compensation

<< SHUTTER >>

- High accuracy shutter with 1 to 1/700 sec. speed
- Programmed electronic shutter controlled by iris motor

<< FLASH >>

- Flashmatic control method with pre-flash and soft-flash

<< BODY >>

- Weatherproof construction (JIS level 4 equivalent)
- Compact slim Body with retractable Lens Ass'y

Specifications

Type	: 35mm lens shutter auto-focus AE camera with built-in flash.
Lens	: Carl Zeiss Tessar T* 35mm f / 3.5 (4 elements in 3 groups)
Shutter	: Programmed electronic shutter
Exposure control	: Programmed AE
Metering range	: Automatic flash activation mode and red-eye reduction mode; EV 9.5 (f / 3.5, 1 / 60 sec.) ~ EV17 (f /15.5, 1 / 700 sec.); Ondemand flash mode, Night-scene mode (No flash), Distant scenery mode; EV 3.5 (f / 3.5, 1 second) ~ EV17 (f / 15.5, 1 / 700 sec.)
Metering system	: External metering system with dual SPD cell and automatic backlight compensation.
Film speed	: Automatic setting (DX method), Linked in range ISO 50-ISO 3200 (for each step), Automatically set to ISO 100 with DX films outside ISO 50-3200 range and non-DX films.
Focusing system	: Infrared active multi-autofocus system / 160 steps (with focus lock mechanism)
Shooting distance	: About 0.35m (13-13 / 16 in.) ~ ∞ (infinity)
Viewfinder	: Real-image vewfinder, with Super Scope.
Viewfinder display	: ・In viewfinder focusing frame, picture area frame, close-range picture srea frame. ・Eyepiece indicators: Focusing indicator (green LED), flash / camera shake indicator (red LED) ・Super Scope: Center set-up marks
Display panel	: Exposure counter / self-timer remaining time display; picture-taking mode marks [automatic flash activation mode also with Red-eye reduction mode; On-demand flash mode; Night-scene (No flash) mode, Distant scenery mode]; battery warning mark.
Film loding	: Automatic loading mechanism (with automatic winding to frame "1" position).
Film advance	: Auto-winding mechanism.
Film rewinding	: Auto-return / auto-stop mechanism; also mid-roll rewinding possible.
Exposure counter	: Incrementing type LCD with automatic reset.
Self-timer	: Electronic timer function (10 seconds),with flashing LED indicator and cancel function.
Flash	: ・Built-in, flashmatic type. Recharging time approximately 3.5 seconds (with new battery at room temperature, in accordance with our testing standards). ・Shooting range: About 0.35m -3m (ISO 100, color negative film)

Battery : · One 3V Lithium battery (type CR123A or DL123A) · Bsttery capacity: In the case of 50% flash photography, about 20 rolls of 24 frame film, when a new battery is used under room temperature conditions (testing in accordance with our testing standards).

Weatherproof construction

Dimensions and Weight : 118(W)×64.5(H)×39.5(D) mm(4-11 / 16×2-9 / 16×1-9 / 16 in.) 190g(6.7oz.) (without battery).

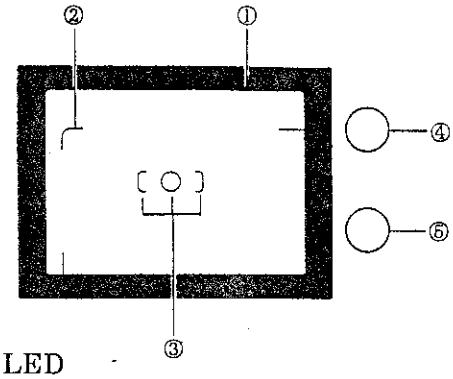
Auto-dating Unit : Built-in quartz clock with LCD display (auto-calender)

Imprint Options : 1.Year / Month / Day. 2. Day / Hour / Minute. 3. No imprint. 4. Month / Day / Year. 5. Day / Month / Year.

Dimensions and Weight : 118(W)×64.5(H)×42(D)mm (4-11 / 16×2-9 / 16×1-11 / 16 in.), 200g (7.1oz.) (without battery).

*Specifications and design are subject to change without notice.

VIEWFINDER DISPLAY



①Picture Frame
Place the subject in this picture frame when photograhing at distances between long distance and approximately 0.7 meter.

②Close-Range Picture Frame
Place the subject in this picture frame when photograhing at a distance between approximately 0.7 meter and 0.35 meter.

③Focusing Frame
The frame for focusing on the subject.

④ Red LED

Lighting (Displayed when the shutter release is pressed halfway down):

- Advance instruction of flash lighting during automatic flash activation mode, red-eye reduction mode and on-demand flash mode.
- Warns of camera shake during night-scene mode or distant scenery mode.

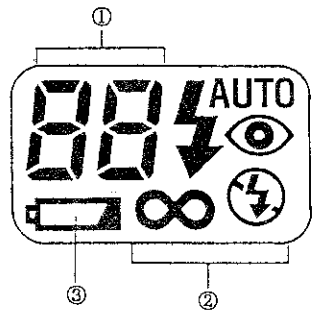
Blinking : During flash charging (goes out when charging is completed).

⑤ Green LED (Displayed when the shutter release is pressed halfway down)

Lighting : When the camera is focused.

Blinking : When the subject is not properly in focus.

DISPLAY PANEL

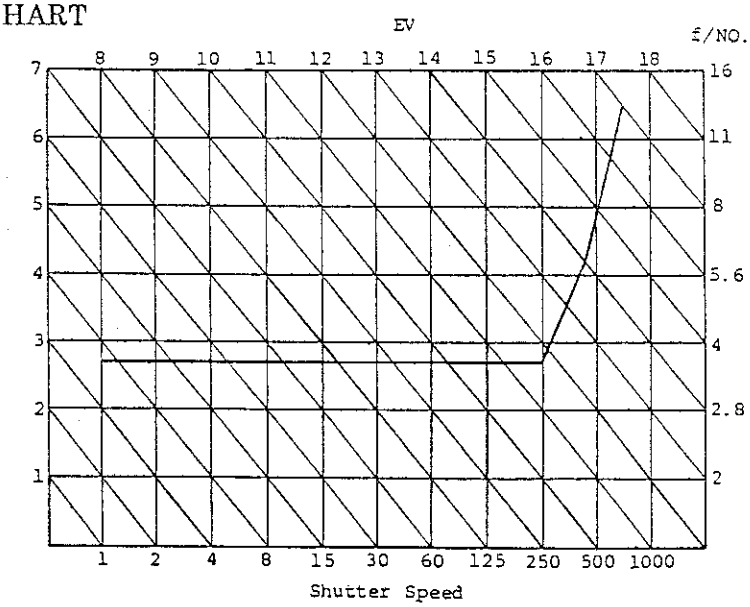


①Exposure counter / Self-Timer remaining time

②Shooting Mode Mark
Display for automatic flash activation mode , Red-eye reduction mode , On-demand flash mode , Night-scene mode , Distant scenery mode .

③Battery Warning Mark
Warns when it is the time to replace the battery.

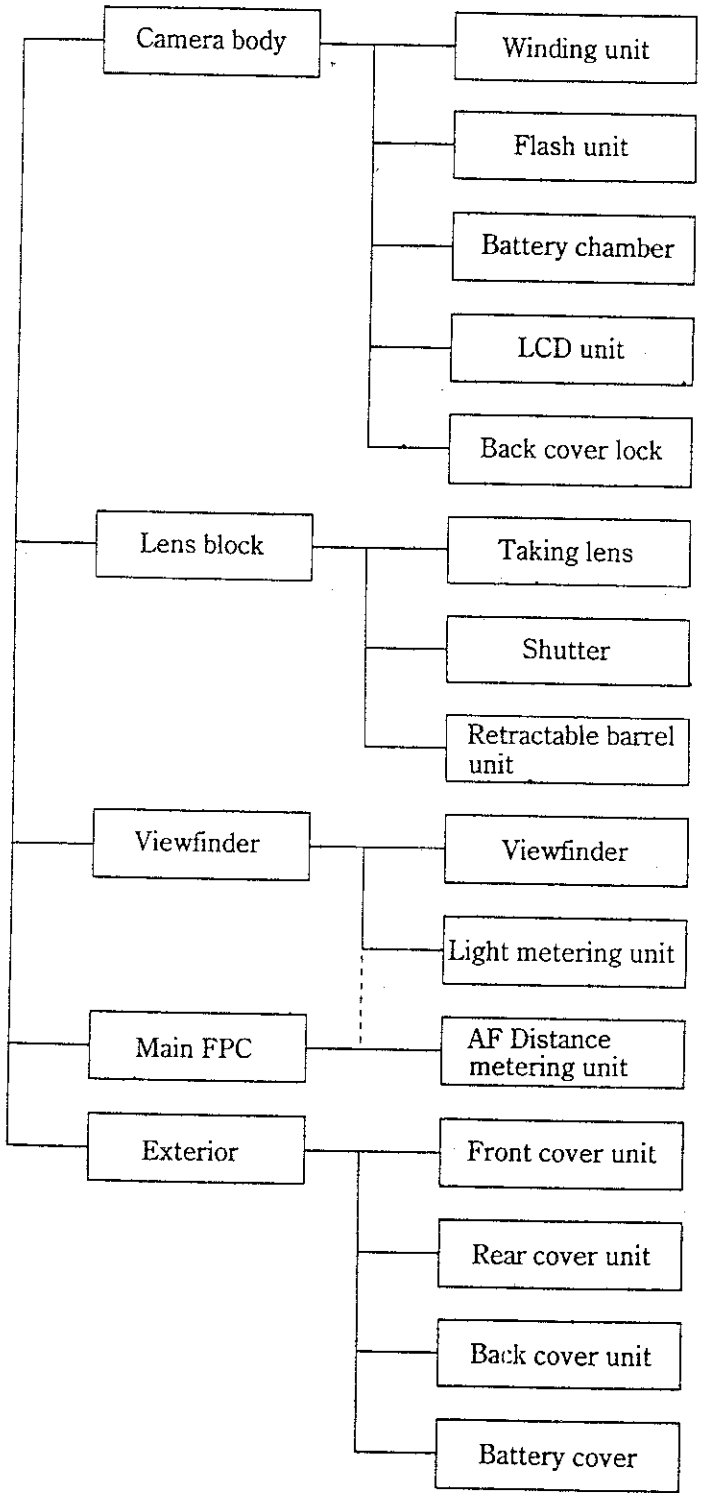
PROGRAM CHART

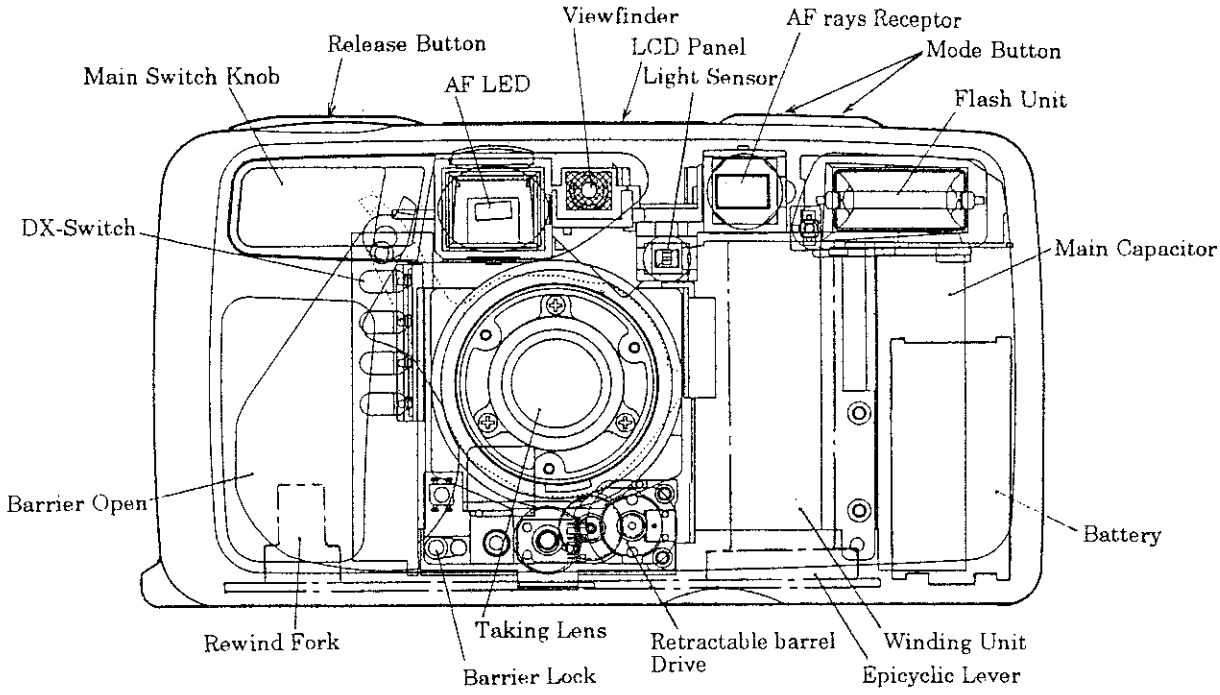


INTERNAL STRUCTURE

This camera consistes of five major blocks ——— camera body, lens block, viewfinder, main FPC and exterior.

Mechanical System Diagram





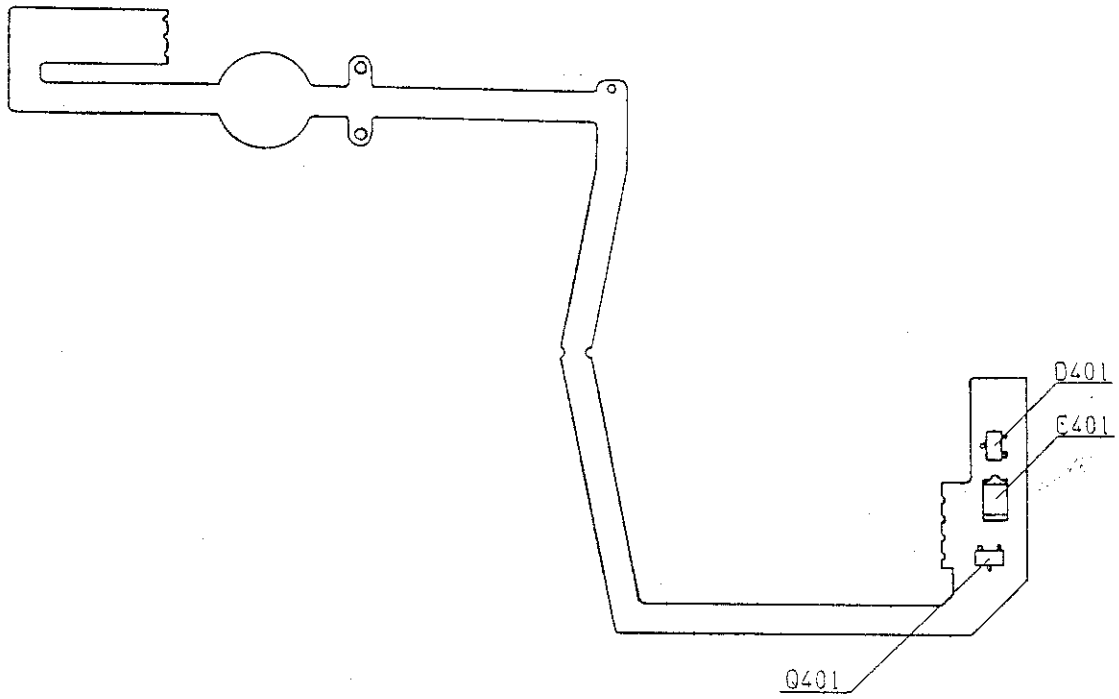
[Winding Unit]

This camera uses a single motor for controls winding and rewinding.
The winding motor is located in the spool. The spool and the winding motor are integrated in a single unit.
The rewinding gear train, positioned on the bottom of the camera Body, is connected with the Epicyclic gear clutch.
The rotation of the winding motor shaft is transferred via the differential gear train to the projections of the spool to perform winding.
For rewinding, the motor is reversed to rotate the rewind fork via the spool gear, the Epicyclic gear and the gear train.
The reflection type photo-interrupter detects perforations to control winding and rewinding.

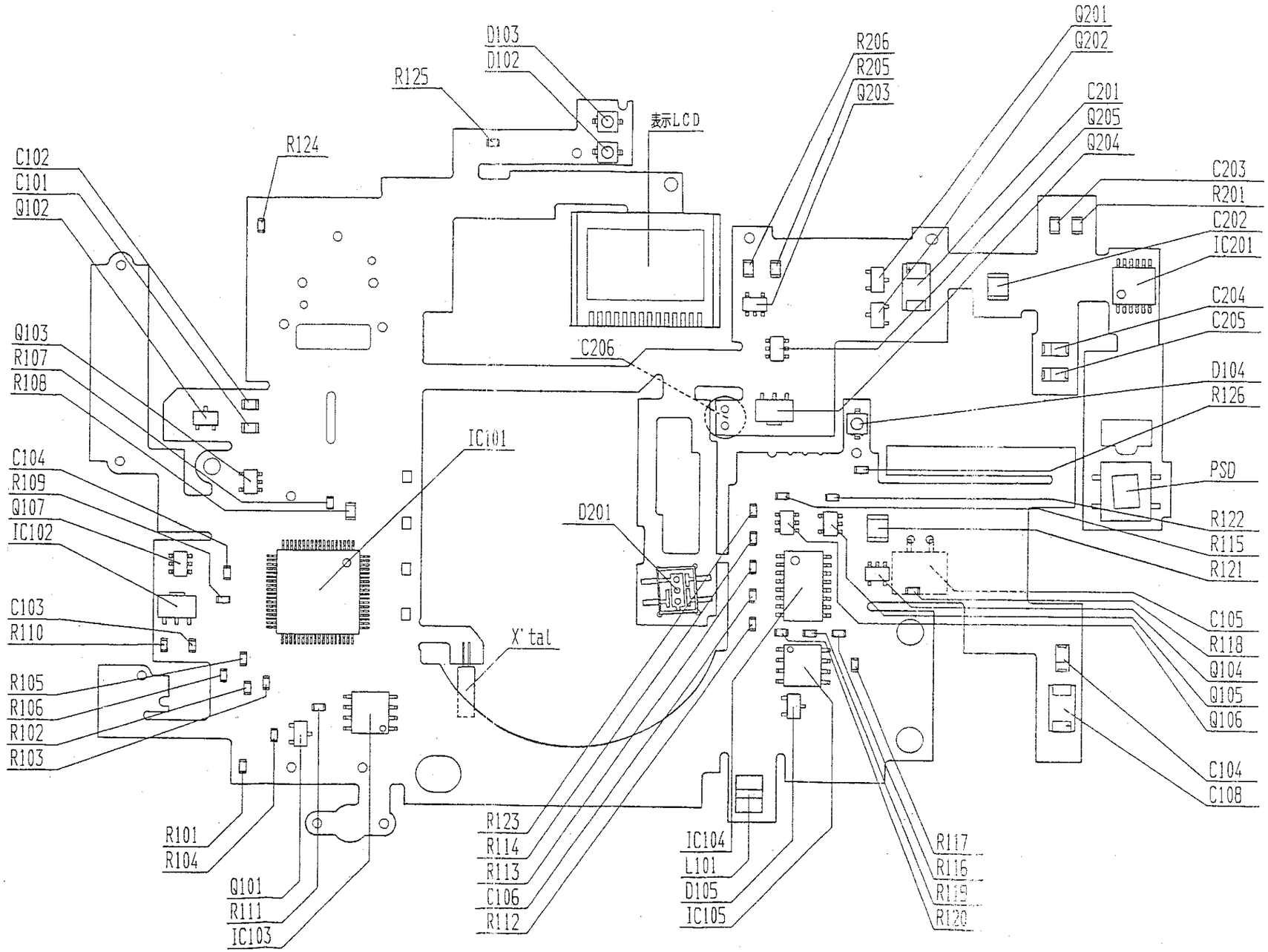
[Flash Unit]

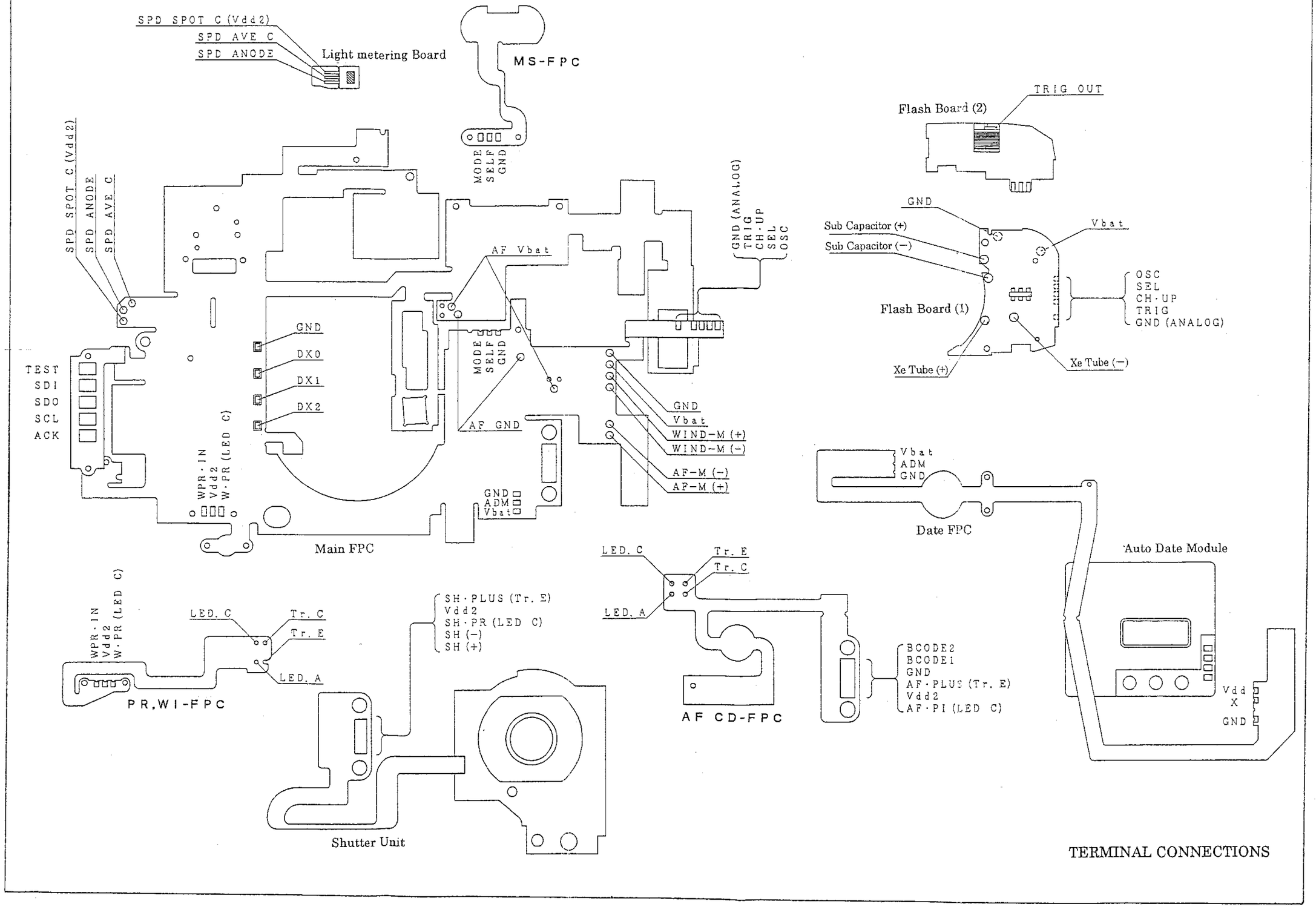
This small flash in the upper right part of the Body is of a flashmatic control type in common for Slim T and Yashica T4.
Charging is conducted in separately-excited system booster circuit.
Pre-flash design. A large thyristor and a twin-capacitor circuit controls flashing.
Sub Capacitor restraints the light for close subjects (soft flash), This camera has a function to prevent overexposure when taking picture with flash at a close distance.
The CPU controls the start and stop of charging the flash capacitor and the flash timing.

Electric Parts on Date FPC



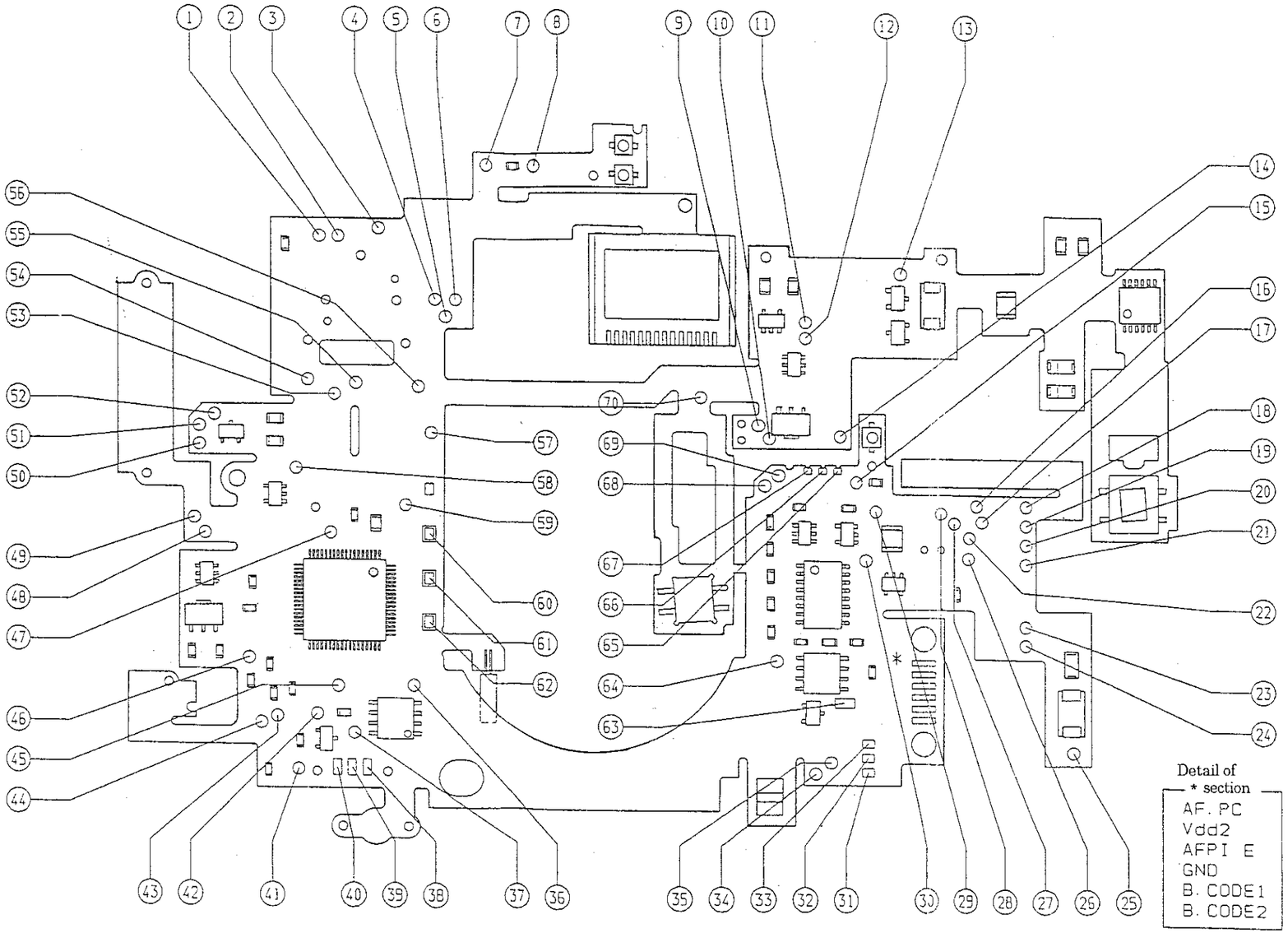
Electric Parts on Main FPC





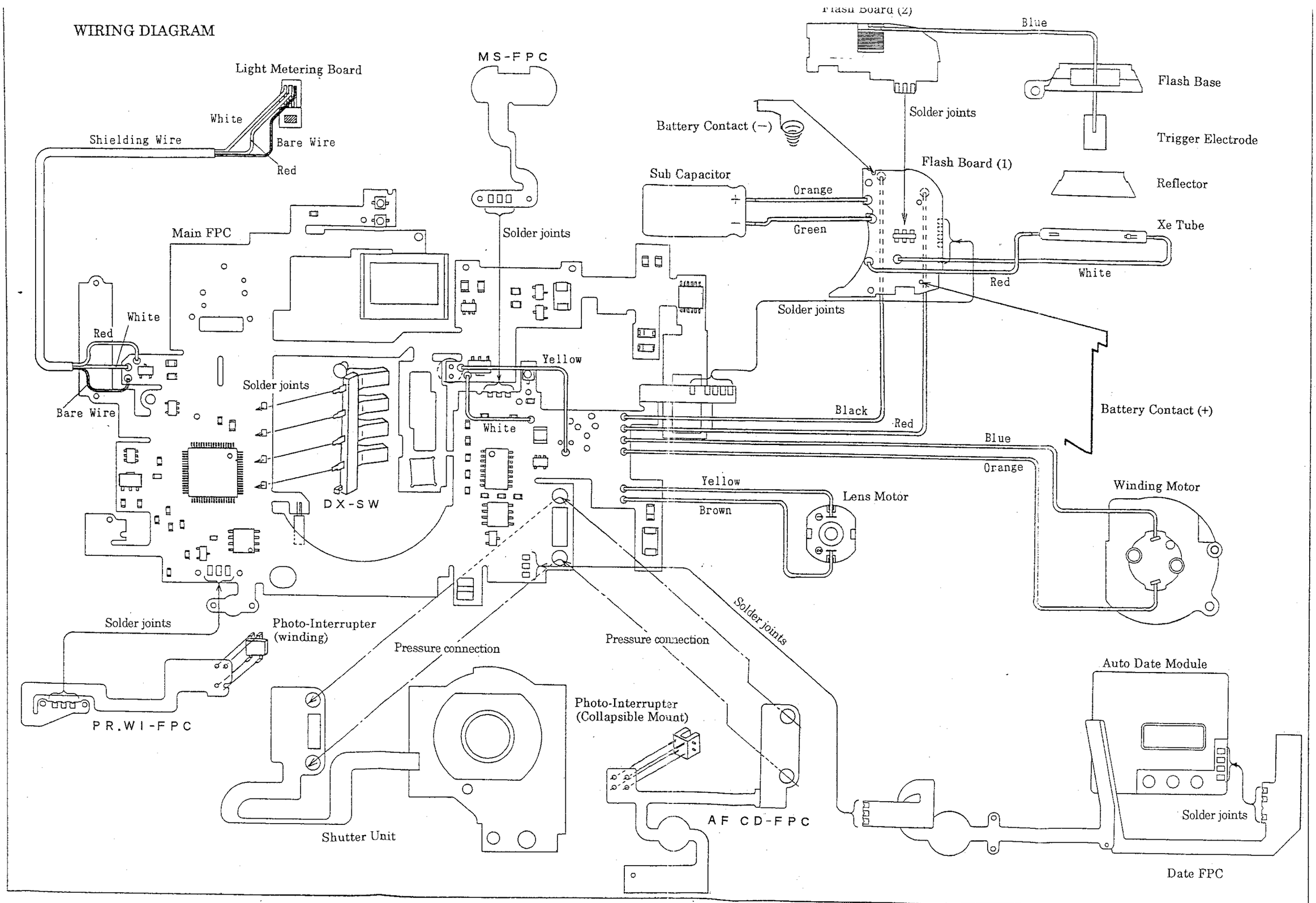
TERMINAL CONNECTIONS

TEST POINTS ON MAIN FPC



No.	Symbol	No.	Symbol
1	RELEASE (S2)	36	REWIND
2	CHECK (S1)	37	SCL(SCK)
3	Vdd3 (LED power)	38	W·PR (W-P·R cathode)
4	SELF (S3)	39	Vdd2
5	GND	40	WPR·IN
6	MODE	41	AF/SH·PULS
7	Flash LED	42	PI·IN
8	Focus LED	43	SH·PC (SH-P·R cathode)
9	Vbat (AF)	44	B·COVER
10	GND (AF)	45	AF·PC (AF-P·I cathode)
11	AF-LED cathode (R)	46	RESET
12	AF-LED cathode (L)	47	D/A
13	LED	48	SDI
14	AF-LED cathode (C)	49	TEST
15	Self-timer LED	50	Vdd2 (SPD SPOT)
16	TRIG	51	SPD anode (SPOT, AVE)
17	CH·UP	52	Vspd (SPD AVE)
18	GND	53	AF·DATA
19	Vbat	54	IRED(C)(AF-LED·C)
20	AF-M(-),WIND-M(+)	55	IRED(L)(AF-LED·L)
21	WIND-M(-)	56	IRED(R)(AF-LED·R)
22	GND	57	LCOV2
23	AF-M(-),WIND-M(+)	58	AF·CNTL
24	AF-M(+),SH(-)	59	LCOV1
25	Vdd1	60	DX0
26	Vbat	61	DX1
27	SEL,ACK	62	DX2
28	OSC	63	B·C
29	GND	64	PW1(DC·DC-ON)
30	SH(+)	65	GND
31	Vbat	66	SELF(S3)
32	ADM(X),SDO	67	MODE
33	GND	68	SELF(S3)
34	B·CODE2	69	MODE
35	B·CODE1	70	Vbat

WIRING DIAGRAM



KYOCERA

T PROOF

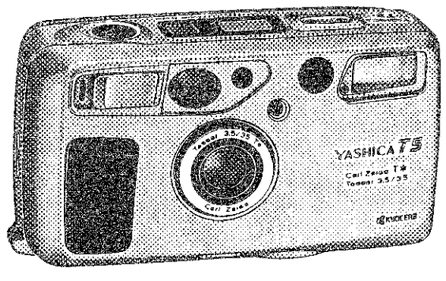
YASHICA

T5 / T5 D

YASHICA

T4 Super / T4 Super D

ASSEMBLING CHART



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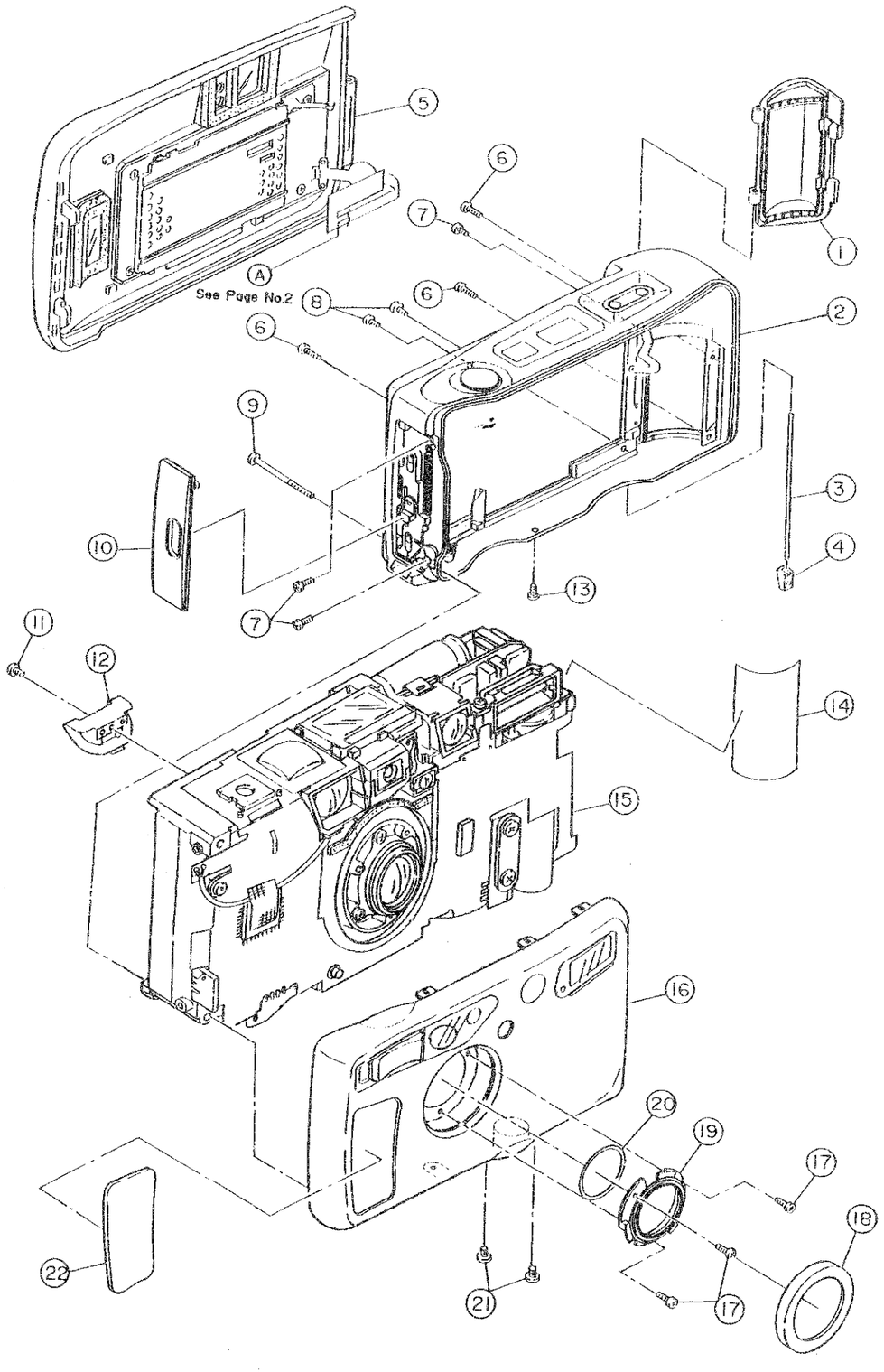
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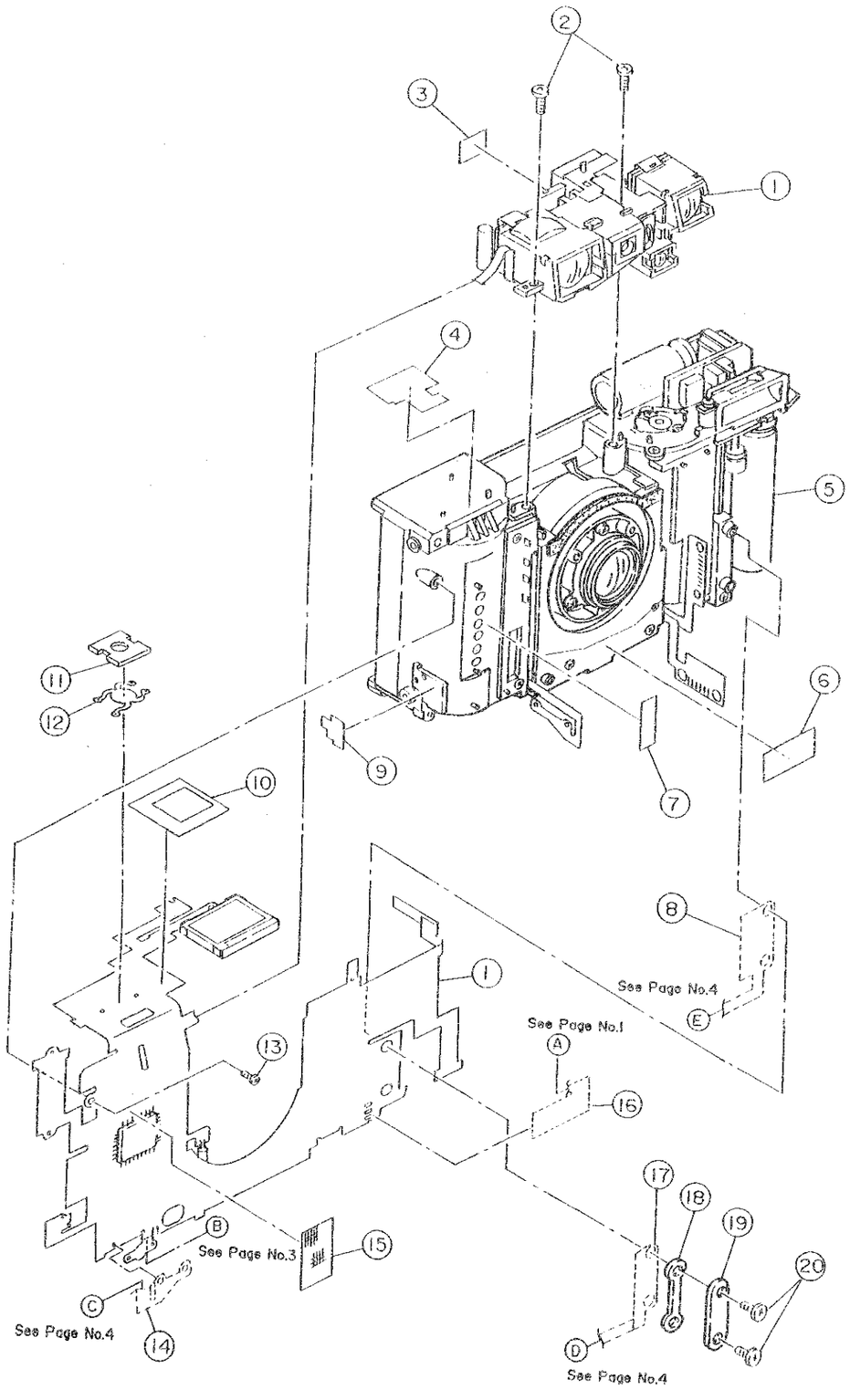
	PARTS NO.	DESCRIPTION	QTY
1	3CPB3800	BATTERY COVER ASS'Y (For K-T PROOF·G)	1
	3CPB380B	BATTERY COVER ASS'Y (For Y-T4S·B ; Y-T4S(D)·B ; Y-T5·B ; Y-T5(D)·B)	1
	3CPB380S	BATTERY COVER ASS'Y (For K-T PROOF·S ; Y-T5·S ; Y-T5(D)·S)	1
2	*	REAR COVER ASS'Y (See Page No.5)	1
3	3AZ15500	HINGE SHAFT	1
4	3CP36600	HINGE COVER (For K-T PROOF·G)	1
	3CP33700	HINGE COVER (For Y-T4S·B ; Y-T4S(D)·B ; Y-T5·B ; Y-T5(D)·B)	1
	3CP38300	HINGE COVER (For K-T PROOF·S ; Y-T5·S ; Y-T5(D)·S)	1
5	*	BACK COVER (D) ASS'Y (See Page No.5)	1
6	69115576	FRONT COVER ASS'Y S.S	3
7	66001214	REAR COVER ASS'Y S.S	3
8	69113576	REAR COVER ASS'Y S.S	2
9	66001213	FRONT COVER ASS'Y S.S	1
10	3CP36810	B. LOCK PLATE COVER (For K-T PROOF·G)	1
	3CP34910	B. LOCK PLATE COVER (For Y-T4S·B ; Y-T4S(D)·B ; Y-T5·B ; Y-T5(D)·B)	1
	3CP37900	B. LOCK PLATE COVER (For K-T PROOF·S ; Y-T5·S ; Y-T5(D)·S)	1
11	69112576	CARTRIDGE LIFTER S.S	1
12	3AZ10200	CARTRIDGE LIFTER	1
13	66001216	FRONT COVER ASS'Y S.S	1
14	3AZ10500	BATTERY LABEL	1
15	*	BODY	1
16	3CPB5000	FRONT COVER ASS'Y (For K-T PROOF·G)	1
	3CPB500S	FRONT COVER ASS'Y (For K-T PROOF·S)	1
	3CPB5Y40	FRONT COVER ASS'Y (For Y-T4S·B)	1
	3CPB5Y4D	FRONT COVER ASS'Y (For Y-T4S(D)·B)	1
	3CPB5Y50	FRONT COVER ASS'Y (For Y-T5·B)	1
	3CPB5Y5D	FRONT COVER ASS'Y (For Y-T5(D)·B)	1
	3CPB550S	FRONT COVER ASS'Y (For Y-T5·S)	1
	3CPB55DS	FRONT COVER ASS'Y (For Y-T5(D)·S)	1
17	69013576	SHUTTER FRAME FRONT RING S.S	3
18	3CP21400	LENS CELL FRONT RING (For K-T PROOF·G ; Y-T4S·B ; Y-T4S(D)·B ; Y-T5·B ; Y-Y5(D)·B)	1
	3CP38000	LENS CELL FRONT RING (For K-T PROOF·S ; Y-T5·S ; Y-T5(D)·S)	1
19	3CP21100	SHUTTER FRAME FRONT RING	1
20	3CP21510	FRONT RING PACKING	1
21	66001215	FRONT COVER ASS'Y S.S	2
22	3CP31810	GRIP RUBBER (For K-T PROOF·G ; Y-T4S·B ; Y-T4S(D)·B ; Y-T5·B ; Y-Y5(D)·B)	1
	3CP38600	GRIP RUBBER (For K-T PROOF·S ; Y-T5·S ; Y-T5(D)·S)	1

NOTE : Parts marked * are not available.
: For domestic market.
K-T PROOF·G ----- KYOCERA T PROOF · Dark Gray finish Camera
K-T PROOF·S ----- KYOCERA T PROOF · Silver finish Camera
: For North America export market.
Y-T4S·B ------ YASHICA T4 Super · Black finish Camera
Y-T4S(D)·B ------ YASHICA T4 Super(D) · Black finish Camera
: For European and Agent export market.
Y-T5·B ------ YASHICA T5 · Black finish Camera
Y-T5(D)·B ------ YASHICA T5(D) · Black finish Camera
Y-T5·S ------ YASHICA T5 · Silver finish Camera
Y-T5(D)·S ------ YASHICA T5(D) · Silver finish Camera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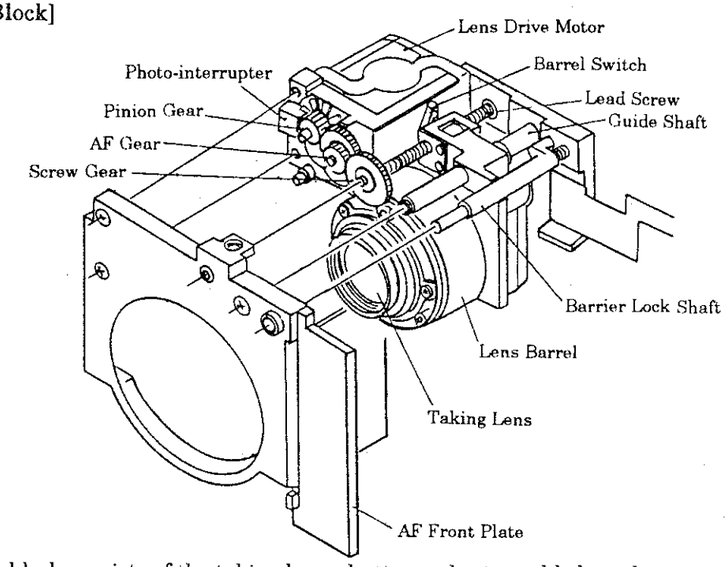
	PARTS NO.	DESCRIPTION	QTY
1	3CPB2100	AF BASE W/MAIN FPC ASS'Y	1
2	69214076	AF BASE S.S	2
3	*	DOUBLE STICK TAPE	1
4	3CP10600	RELEASE TAPE	1
5	*	BODY	1
6	39682200	GM TAPE (2)	1
7	*	DOUBLE STICK TAPE	1
8	*	SHUTTER FPC (See Page No.4)	1
9	3CP35500	B. LOCK TAPE	1
10	3CP10900	N. FPC TAPE	1
11	3AZ31600	RELEASE SWITCH COVER	1
12	38412500	RELEASE SWITCH	1
13	69213076	MAIN FPC S.S	1
14	*	PR. WI-FPC (See Page No.4)	1
15	*	ACETATE CLOTH TAPE	1
16	*	DATE FPC (See Page No.1)	1
17	*	AF CD-FPC (See Page No.4)	1
18	3AZ51700	FPC FIXER RUBBER	1
19	3AZ51600	FPC FIXER	1
20	66001148	FPC FIXER S.S	2

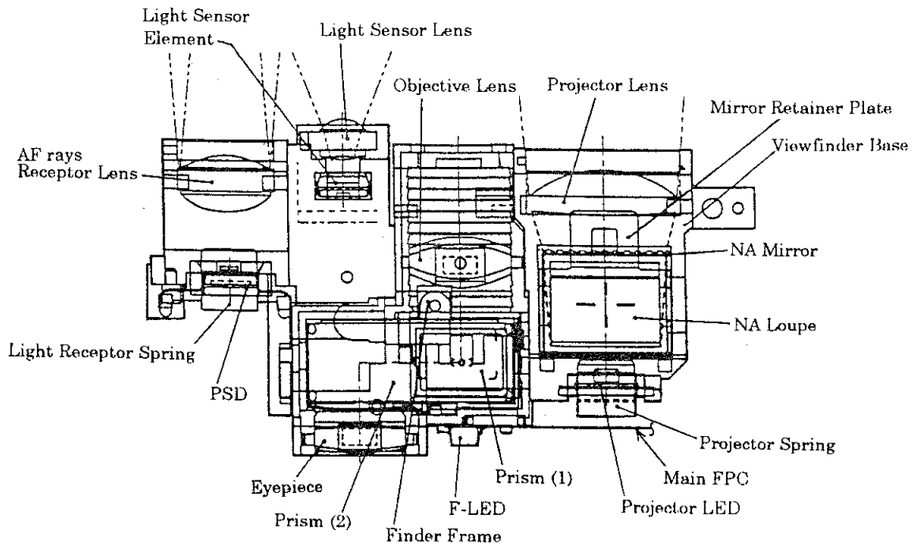
NOTE : Parts marked * are not available.

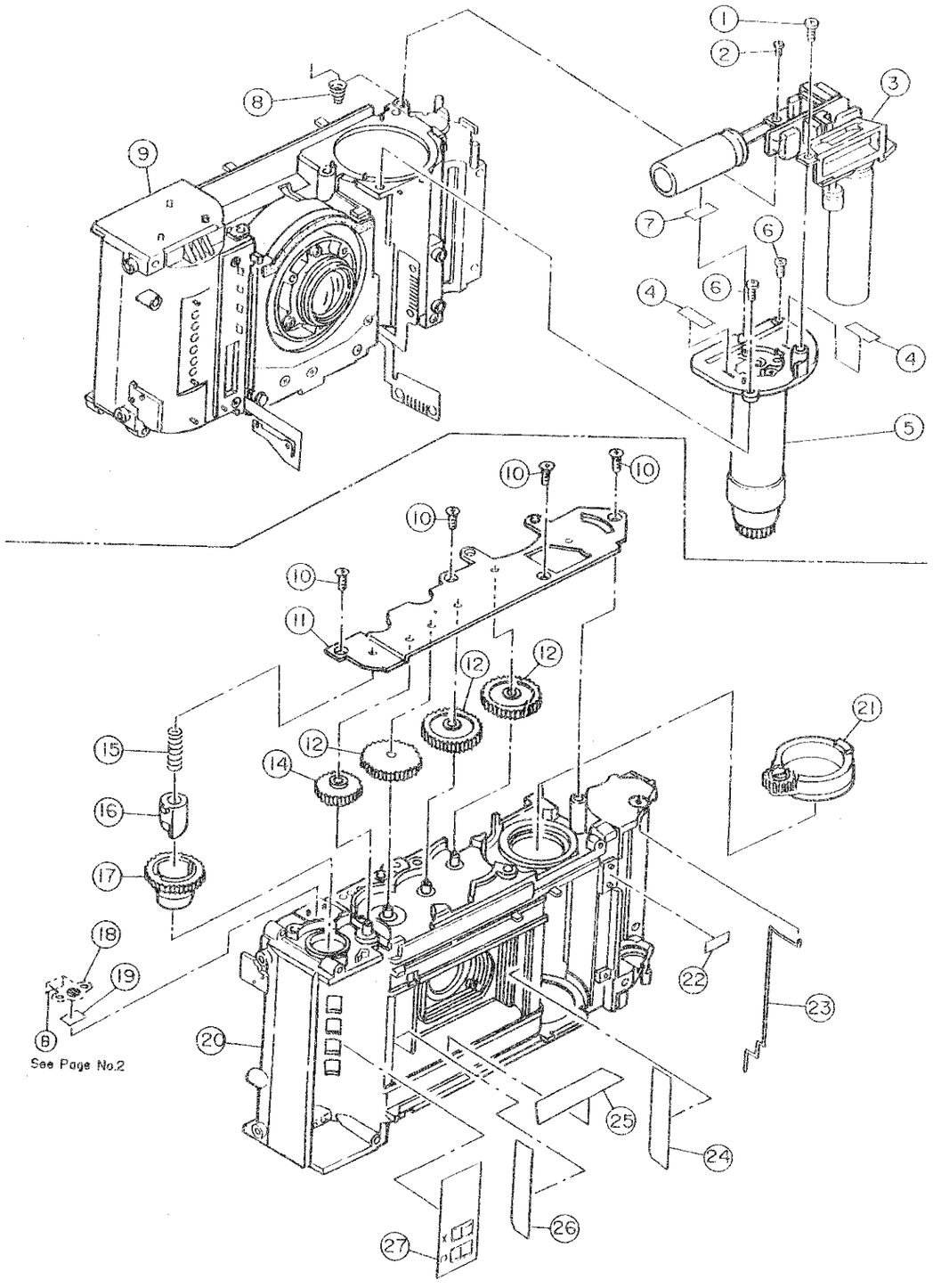
[Lens Block]



The lens block consists of the taking lens, shutter and retractable barrel unit.
The rotation of the pinion on a exclusived motor is transferred via a gear train to the screw gear, which controls barrel retracting and focusing with the lead screw and guide shaft.
The signal for control is detected by a photo-interrupter through a slit in the motor pinion gear.
The lens is detected by the position detector switch (barrel switch) and advanced to a proper position.

[Viewfinder]

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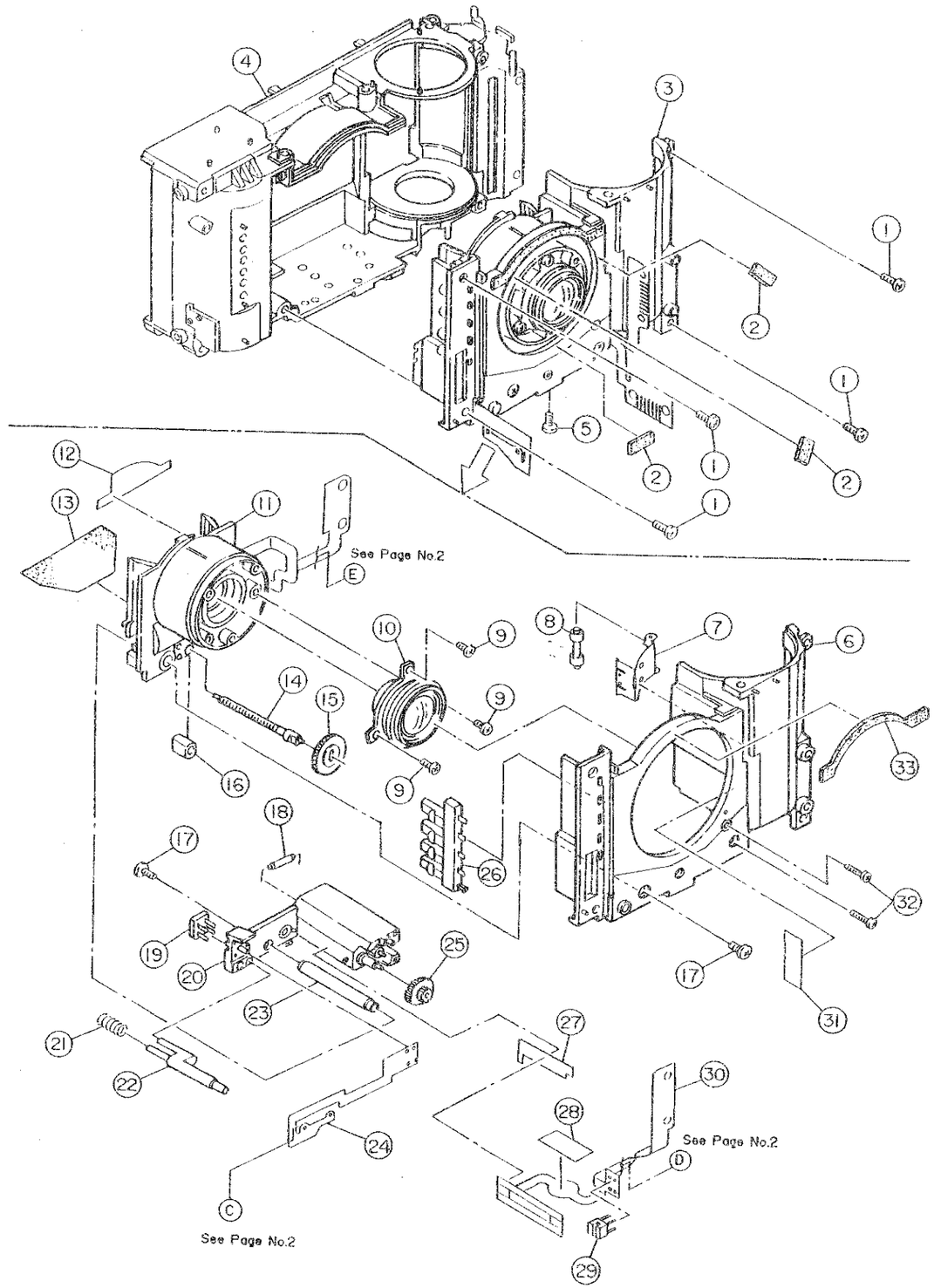
	PARTS NO.	DESCRIPTION	QTY
1	69213076	FLASH ASS'Y S.S	1
2	69102576	FLASH ASS'Y S.S	1
3	3AZAE300	FLASH ASS'Y	1
4	3AZ61500	BASE LIGHT-PROOF TAPE	2
5	3AZ60100	WINDING UNIT	1
6	69113576	WINDING UNIT S.S	2
7	*	DOUBLE STICK TAPE	1
8	3AZ10420	BATTERY CONTACT (-)	1
9	*	BODY	1
10	69313576	MM BASE PLATE S.S	4
11	3CP60510	MM BASE PLATE	1
12	3AZ60900	MM GEAR (1)	2
13	3AZ61000	MM GEAR (2)	1
14	3AZ61100	MM GEAR (3)	1
15	3CP60600	REWIND SPRING	1
16	38462220	REWIND FORK	1
17	38462110	REWIND GEAR	1
18	*	MAIN FPC (See Page No.2)	1
19	*	DOUBLE STICK TAPE	1
20	*	BODY	1
21	3CPB1100	EPICYLIC LEVER ASS'Y	1
22	*	DOUBLE STICK TAPE	1
23	3AZ10320	BATTERY CONTACT (+)	1
24	3CP10310	BODY LIGHT-PROOF PAPER (1)	1
25	3CP10520	BODY LIGHT-PROOF TAPE	1
26	3CP10410	BODY LIGHT-PROOF PAPER (2)	1
27	38411900	EXPLANATION SEAL	1

NOTE : Parts marked * are not available.

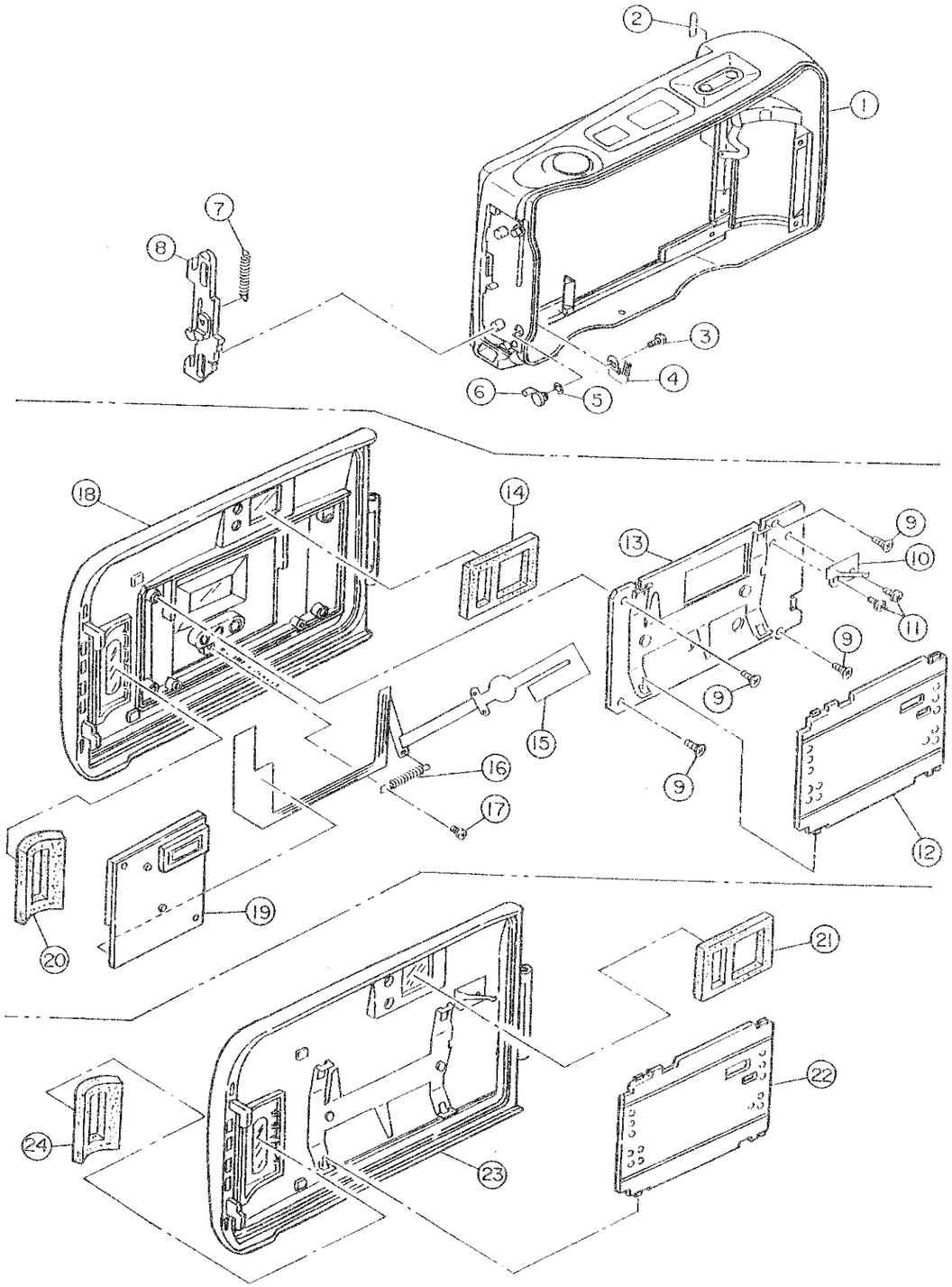

See Page No.2
See Page No.2
See Page No.2

	PARTS NO.	DESCRIPTION	QTY
1	69113576	COLLAPSIBLE MOUNT ASS'Y S.S	4
2	3CP21700	LIGHT-SHIELD BARREL MOQUETTE	3
3	3CPB1200	COLLAPSIBLE MOUNT ASS'Y	1
4	*	BODY	1
5	69112576	COLLAPSIBLE MOUNT ASS'Y S.S	1
6	3CP20100	AF FRONT PLATE	1
7	3BK16500	AL ROLLER HOLDER	1
8	3BK16600	AL ROLLER	1
9	69113576	TAKING LENS UNIT S.S	3
10	3CP22000	TAKING LENS UNIT	1
11	3CP21000	SHUTTER UNIT	1
12	3AZ22720	BARREL LIGHT-PROOF PAPER	1
13	3AZ22510	SHUTTER LIGHT-PROOF PAPER	1
14	3AZ20510	LEAD SCREW	1
15	3AZ20410	LEAD SCREW GEAR	1
16	3AZ20920	LEAD SCREW NUT	1
17	66001029	GUIDE SHAFT S.S	2
18	5ERDA2E15002*13	RESISTOR (15Ω)	1
19	5ENCSG105F***01	PHOTO-INTERRUPTER (For Winding)	1
20	*	AF MOTOR HOLDER	1
21	3AZ23600	BARRIER LOCK SPRING	1
22	3AZ23500	BARRIER LOCK SHAFT	1
23	3AZ20610	GUIDE SHAFT	1
24	3CP50900	PR. WI-FPC	1
25	3AZ20300	AF GEAR (1)	1
26	3AZ12100	DX-SW	1
27	3AZ21510	LENS BARREL FPC TAPE	1
28	*	DOUBLE STICK TAPE	1
29	5ENCSG227****01	PHOTO-INTERRUPTER (For Collapsible Mount)	1
30	3CP50800	AF CD-FPC	1
31	*	DOUBLE STICK TAPE	1
32	69115576	AF FRONT PLATE S.S	2
33	3CP21600	AF FRONT PLATE MOQUETTE	1
19,20,24,27,	3CPB1300	AF MOTOR HOLDER ASS'Y	1

NOTE : Parts marked * are not available.

No. 5

REF No. 3CP



	PARTS NO.	DESCRIPTION	QTY
	For Rear Cover Ass'y Parts List (See Page No.1)		
1	*	REAR COVER	1
2	35813000	FILM MARK	1
3	69202076	B. SW CONTACT S.S	1
4	3CP35310	B. SW CONTACT	1
5	3CP35410	B. LOCK PACKING	1
6	3CP35220	B. LOCK LEVER	1
7	3CP35110	B. LOCK SPRING	1
8	3CP35020	B. LOCK PLATE	1
1~8,	3CPB4000	REAR COVER ASS'Y (For K-T PROOF·G)	1
	3CPB400S	REAR COVER ASS'Y (For K-T PROOF·S)	1
	3CPB4Y40	REAR COVER ASS'Y (For Y-T4S·B)	1
	3CPB4Y4D	REAR COVER ASS'Y (For Y-T4S(D)·B)	1
	3CPB4Y50	REAR COVER ASS'Y (For Y-T5·B)	1
	3CPB4Y5D	REAR COVER ASS'Y (For Y-T5(D)·B)	1
	3CPB450S	REAR COVER ASS'Y (For Y-T5·S)	1
	3CPB45DS	REAR COVER ASS'Y (For Y-T5(D)·S)	1
	For Data Back Cover Ass'y Parts List (See Page No.1)		
9	69313076	BACK COVER BASE PLATE ASS'Y S.S	4
10	3CP12700	FILM GUIDE	1
11	62902026	FILM GUIDE S.S	2
12	3BR35200	PRESSURE PLATE	1
13	3CPB3400	BACK COVER BASE PLATE ASS'Y	1
14	3CP12200	EYE-PIECE WINDOW MOQUETTE	1
15	3CPE1300	DATE FPC ASS'Y	1
16	3CP15310	DATE SPRING	1
17	66001154	DATE SPRING S.S	1
18	*	BACK COVER (D)	1
19	3CK56100	AUTO DATE MODULE	1
20	3CP12610	CARTRIDGE WINDOW MOQUETTE	1
9~20,	3CPB3300	BACK COVER (D) ASS'Y (For K-T PROOF·G)	1
	3CPB33DB	BACK COVER (D) ASS'Y (For Y-T4S(D)·B ; Y-T5(D)·B)	1
	3CPB33DS	BACK COVER (D) ASS'Y (For K-T PROOF·S ; Y-T5(D)·S)	1
	For Non-data Back Cover Ass'y Parts List		
21	3CP12200	EYE-PIECE WINDOW MOQUETTE	1
22	3BR35200	PRESSURE PLATE	1
23	*	BACK COVER (N)	1
24	3CP12610	CARTRIDGE WINDOW MOQUETTE	1
21~24,	3CPB3200	BACK COVER (N) ASS'Y (For Y-T4S·B ; T-T5·B)	1
	3CPB320S	BACK COVER (N) ASS'Y (For T-T5·S)	1

NOTE : Parts marked * are not available.

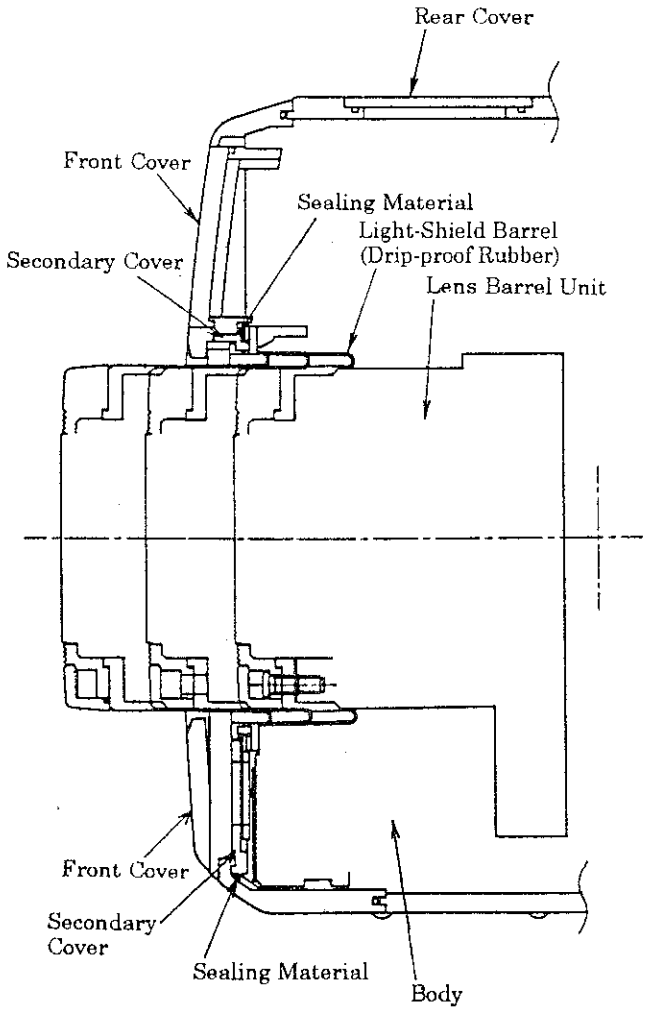
The viewfinder is of a bright and clear real image type.
This viewfinder of 0.43 magnifications (at infinity), with a view rate of 82% (at infinity), uses a parallax compensation mark for the field of view in a closest area of 0.35m.
The optical system consists of the objective lens, eyepiece, prism (1), prism (2), finder frame, projector lens, AF ray receptor lens, NA mirror, NA loupe and light sensor lens.
The AF-LED for the AF system, incorporated in the Main FPC, is locked on the viewfinder base by the projector spring.
Also the PSD, incorporated in the Main FPC, is locked on the viewfinder base by the light receptor spring.
As the light metering element, a 2-segment SPD permitting backlight correction shooting is inserted from above in the hole in the viewfinder base.

[Main FPC]

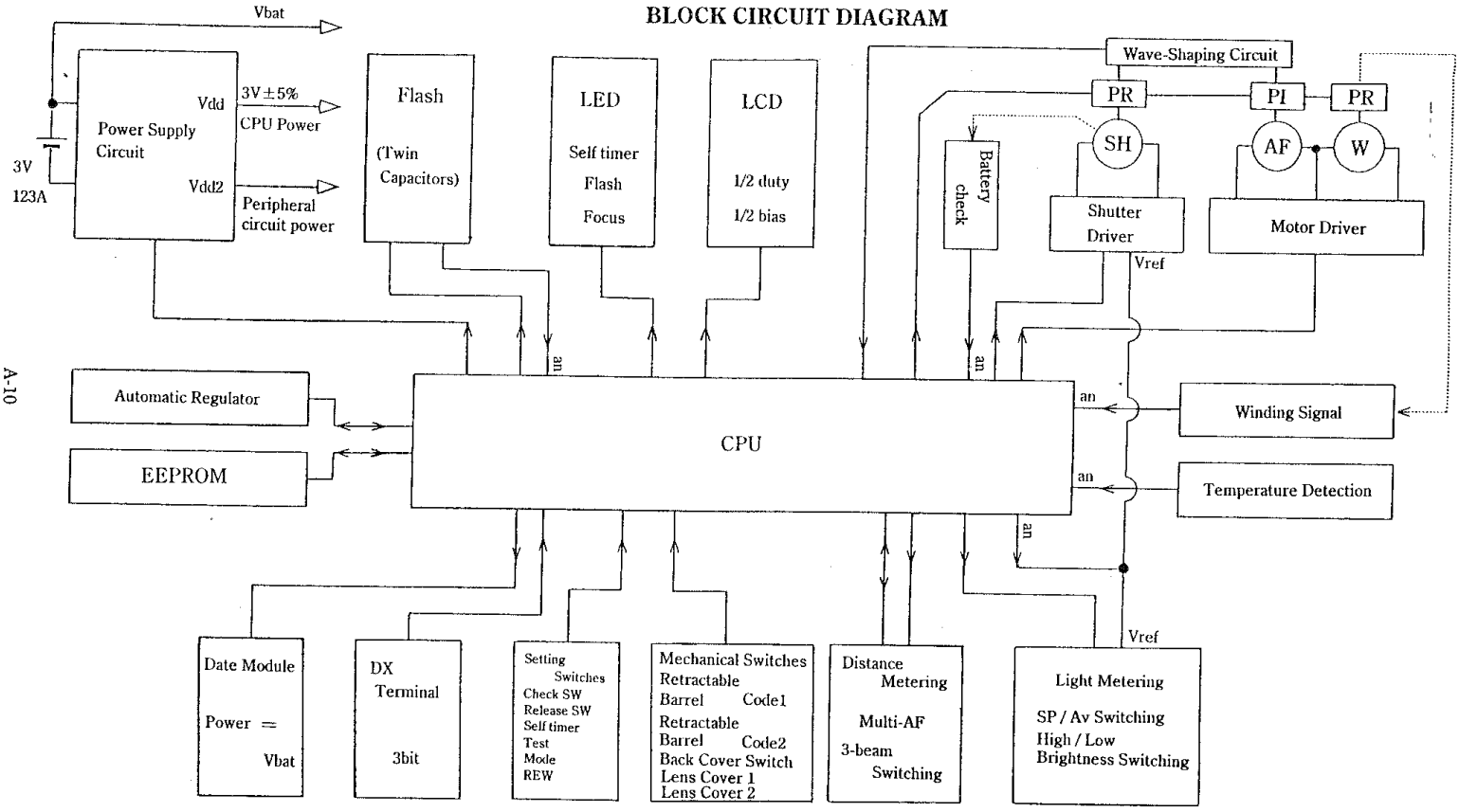
The Main FPC incorporates an 8-bit CPU which controls the all camera functions and the operation of the shutter. In addition to the CPU, the FPC is provided with various important functions such as EEPROM for backup memory, reset circuit, input switches, AF circuit (AF-LED, PSD), power circuit, motor drive circuit (AF, winding, shutter), LEDs, LCDs and light metering circuit.

[Exterior / Lens Barrier]

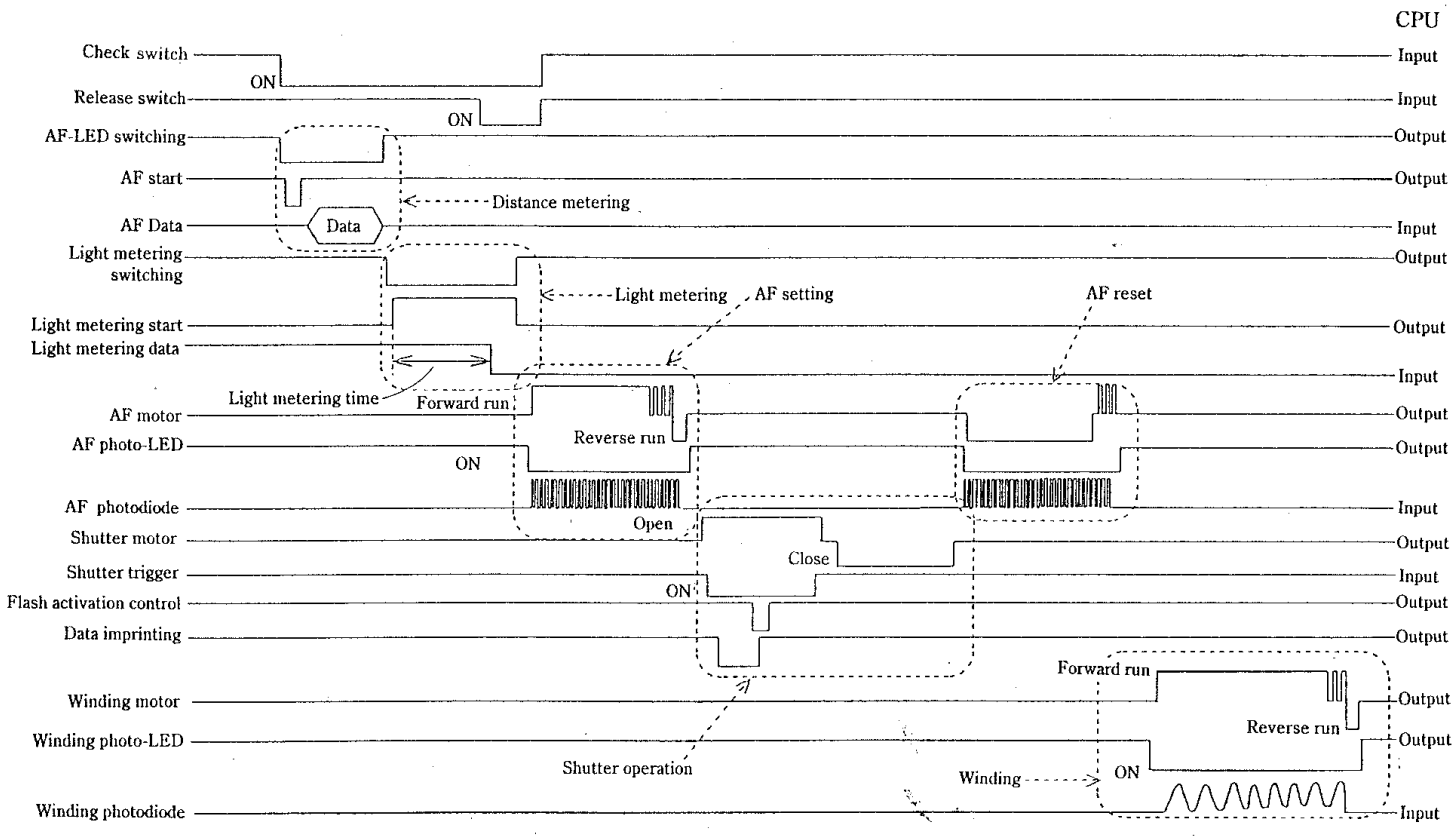
Drip-proof is available under normal life condition (weather proof) by the construction with a particularly designed packing for the lens barrel and the front cover. Cover Glasses and Buttons on the Front Panel have sealing material painted on their back. Barrier moving area and Body is shielded off from water drop by the secondary cover and the shielding rubber. Rubber shielder is glued on around the Rear Cover to fully adhered.
The lens barrier is located in the front cover. Operating the main switch knob from "OFF" to "ON" will open the barrier (power turns ON at this moment) and advance the lens barrel.
Operating the main switch knob from "ON" to "OFF" (power turns OFF at the moment) will restore the lens barrel to its original position. Then the barrier lock will be released and the lens barrier will be closed by the spring.



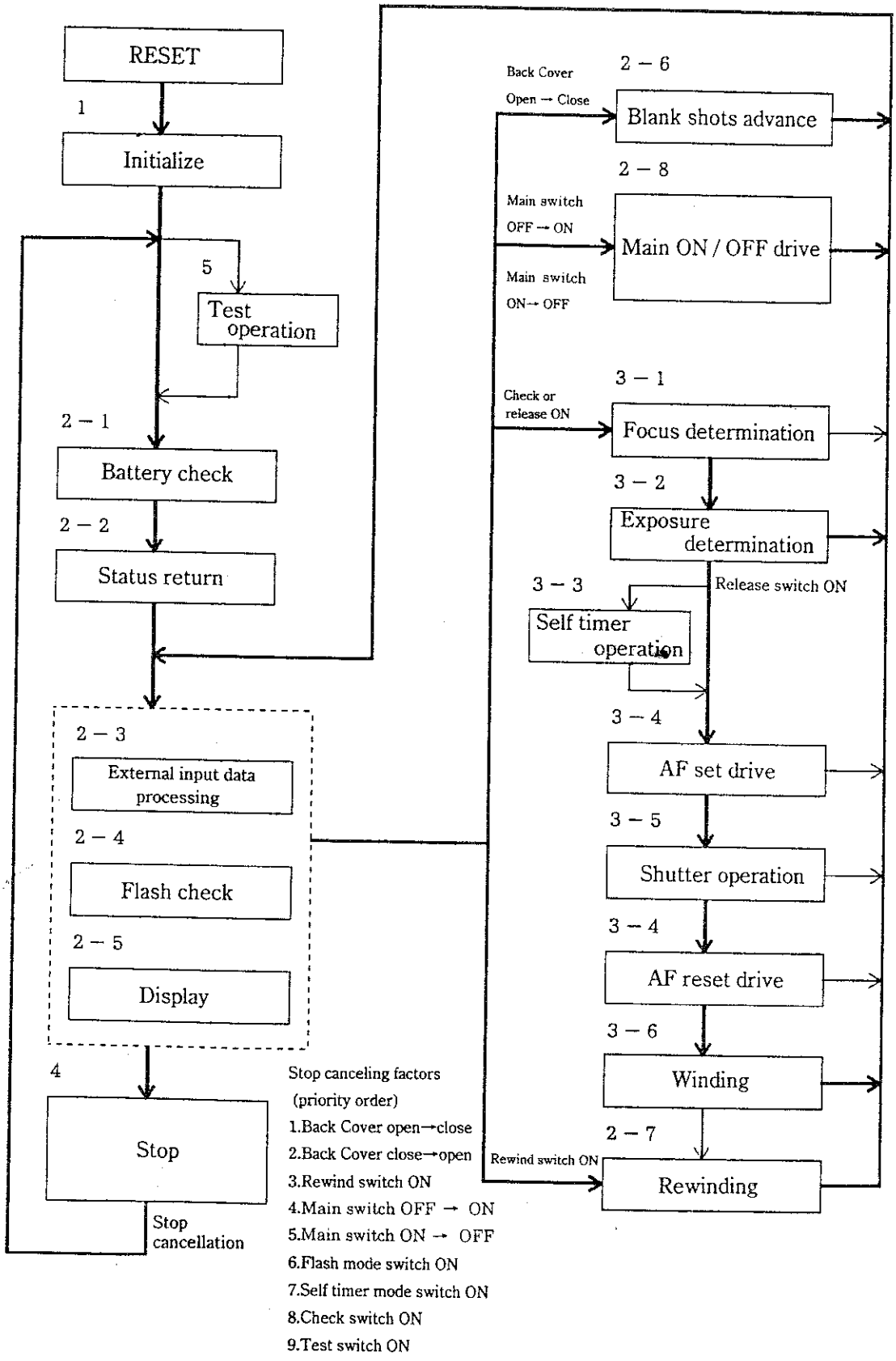
BLOCK CIRCUIT DIAGRAM



TIMING CHART



FLOW CHART


RESET
1
Initialize
5
Test operation
2 – 1
Battery check
2 – 2
Status return
2 – 3
External input data processing
2 – 4
Flash check
2 – 5
Display
4
Stop
Stop cancellation
Back Cover Open → Close
2 – 6
Blank shots advance
2 – 8
Main switch OFF → ON
Main switch ON→ OFF
Main ON / OFF drive
Check or release ON
3 – 1
Focus determination
3 – 2
Exposure determination
Release switch ON
3 – 3
Self timer operation
3 – 4
AF set drive
3 – 5
Shutter operation
3 – 4
AF reset drive
3 – 6
Winding
2 – 7
Rewind switch ON
Rewinding
Stop canceling factors
(priority order)
1.Back Cover open→close
2.Back Cover close→open
3.Rewind switch ON
4.Main switch OFF → ON
5.Main switch ON → OFF
6.Flash mode switch ON
7.Self timer mode switch ON
8.Check switch ON
9.Test switch ON

OUTLINE OF FUNCTION

1. Initialize

At the reset start, performs to initialize the port, register, interrupt, timer, and RAM; and read the adjust value from EEPROM.

2. Shooting ready

2-1. Battery Check

Checks the battery voltage before shifting from the STOP status to the function status, and indicates warning (or prohibit any function) at less voltage than the specified value.

Check method: Detects the battery voltage, which is distributed through resisters while applying current to the shutter motor with load, at A/D port. Compares the value with the data recorded in EEPROM to judge the result of pass or fail.

2-2. Conditions Recovery

①Recovers from error conditions in each function (resets to the initial condition).

② When function was terminated by the weak battery or detached battery during function like rewinding, restarts the terminated function at the next power ON. (For this purpose, every function is recorded its starting condition in EEPROM.)

2-3. Processing of External Input Data

External input data is used for judging the next job at the releasing of STOP status or the completion of an operation.

2-4. Flash Charge Check

In order to keep the flash at charged condition, checks the level of charging and charge until it goes higher than specified level.

Check method: Detects the charging voltage, which is distributed through resisters, at A/D port. Executes charging if the voltage is lower than specified.

2-5. Display

Indicates LED in the viewfinder and LCD according to the external input data.

2-6. Blank Shots Advance

Regardless the status of main switch ON or OFF, performs the blank shots advance for 4 frames or 2 seconds by open and close of the back cover.

2-7. Rewind

Regardless the status of main switch ON or OFF, performs the rewind of film (reverse run of the winding motor) by the rewind switch turns ON.

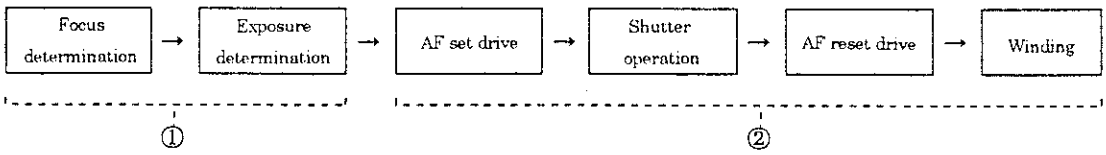
2-8. Main Switch ON/OFF Drive

Turning the main switch "OFF → ON" (Barrier "CLOSE → OPEN"), advances the lens barrel to the photographing ready position.

By the main switch "ON → OFF" (Barrier "OPEN → CLOSE"), restores the lens barrel to its original position.

3. Photographing

The photographing is performed in the following order by the release switch turns ON.



3-1. Focus determination

Measures the distance to the subject by the infrared rays external metering, and calculates the amount of lens moving.

Performs the multiple metering by 3-beam, and supposes a distance to the subject based on each distance information.

The timer event counter on AF-IC imports the metering results and calculates the amount of lens moving with compensating the adjust data written in EEPROM.

3-2. Exposure determination

Measures the subject brightness by SPD; and determines an optimum exposure time according to the flash data (ON or OFF) and Film ISO sensitivity, and the timing for flashing according to the distance data.

The subject brightness is determined by measuring the inversion time of comparator. Internal OP Amp. works as the comparator comparing the standard voltage with SPD output current.

3-3. Self timer operation

Turning the self switch ON, performs ① and then operates ② at 10 seconds later in the process described above Section 3.

3-4. AF set/reset drive

Set : Advances the lens barrel by the distance achieved by focusing from the initial position.

Reset : Returns the lens barrel to its original position.

3-5. Shutter operation

Keeps the shutter open while the exposure time achieved by exposure determination process. If required, activates Flash.

3-6. Winding

Performs winding for one frame. When the film end is detected during the process, starts rewinding (Automatic return).

4. Stop Mode

4-1. Processing of Power ON

Processing relating to the power from STOP status at rising.

4-2. Processing of Power OFF

Processing relating to the power to shift to STOP status.

5. Test Operation

5-1. Automatic adjustment

Conducts check and adjustment (write into EEPROM) of exposure and focus automatically by communicating with adjusters as a complete camera condition at the manufacturing stage.

Adjust items :

AF adjustment : Write the primary formula of AF-IC output pulse and lens drive pulse into EEPROM by measuring actual data from AF-IC at specified distances.

Lens infinity position adjustment : Write the number of lens drive pulse into EEPROM measuring the data at from the lens standard position to the lens infinity position.

AE adjustment : Decide the adjust value of shutter at high brightness range and write into EEPROM. Decide the adjust value of light at image surface at each brightness and write into EEPROM.

5-2. Manual adjustment

Conducts above check and adjustment manually at the service area.
Adjust parameters using each switch to indicate data in LCD panel.

6. Others

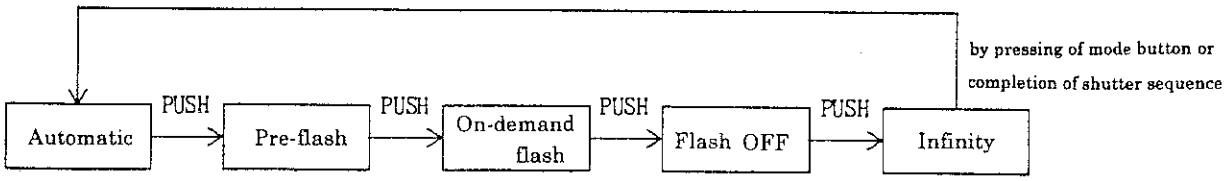
The product has two unique functions other than the normal shutter sequence as follows.

- Self timer

  Turning the self timer button "ON", decides focus and exposure time and then operates shutter at 10 seconds later.

- Flash mode

  The following modes are selectable by pressing the flash mode button.



During RESET or MAIN "OFF → ON", set the mode button at Automatic.
Fix the mode once selected until the main switch turns OFF except the infinity mode. At the infinity mode, it is reset to the Automatic mode after the completion of shutter sequence.

(1) Automatic

Automatic flash firing At the shutter speed less than 1/60 sec.
When the difference of measurement of brightness between "average" and "spot" is more than 1.25 EV (Back light compensation).

BBC mechanism up to 1/60 sec. is operated for controlling flashing.

(2) Pre-flash

Activates pre-flash before main flash.
Condition and control of firing is as same as that of automatic firing.

(3) On-demand flash

Always activates flash.

Flash control is	priority on small iris	at 1/60 sec. and more
	priority on BBC up to 1/60 sec.	at 1/60 sec. and less

(4) Flash OFF

No activation of flash anytime. However, the longest shutter speed is 1 sec. In case of the shutter speed at 1/60 sec. and less, activates the low-light warning (Flash LED lights by the check switch ON).

(5) Infinity

Regardless the distance, extends the lens to the real infinity. No activation of flash cooperated.

DESCRIPTION OF ELECTRONIC CIRCUIT

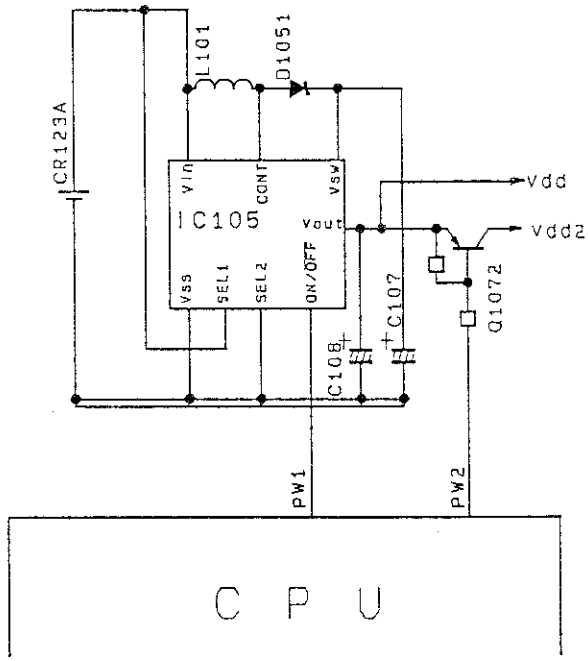
1. Power Supply Circuit

Ⅰ. Functions: ① Generates various powers under control by IC101.
② Generates a regulated voltage of 3V by the boosting circuit.
③ Vdd1=battery voltage at standby

Ⅱ. Operation: ① Booster ON when PW1 (41 pin) is H. Vdd1=3V 2.5%
② Booster OFF when PW1 (41 pin) is L. Vdd1=battery voltage
③ Vdd2 ON when PW2 (35 pin) is L. Vdd2=Vdd1
④ Vdd2 OFF when PW2 (35 pin) is H. Vdd2=0V

Ⅲ. Status: Operation PW1= H, PW2= L
Standby PW1= L, PW2= H

Ⅳ. Circuit diagram



2. Battery Check Circuit (BC Circurt)

Ⅰ. Outlins : ① IC101 checks the remaining power of the battery by A/D conversion.

② Decision is made by two kinds of A/D values — one without load and the other with shutter closing load.

Ⅱ. Function : Makes the following decisions from two kinds of data with load and witout load :

(1) Sufficient power of battery

(2) Battery replacement warning level (B1 level)

(3) Camera operation inhibition level (B2 level)

Ⅲ. Operation : ① Without load

PORT65 (47 pin) =L and PORT41(20 pin) line is A/D converted.

② With shutter load

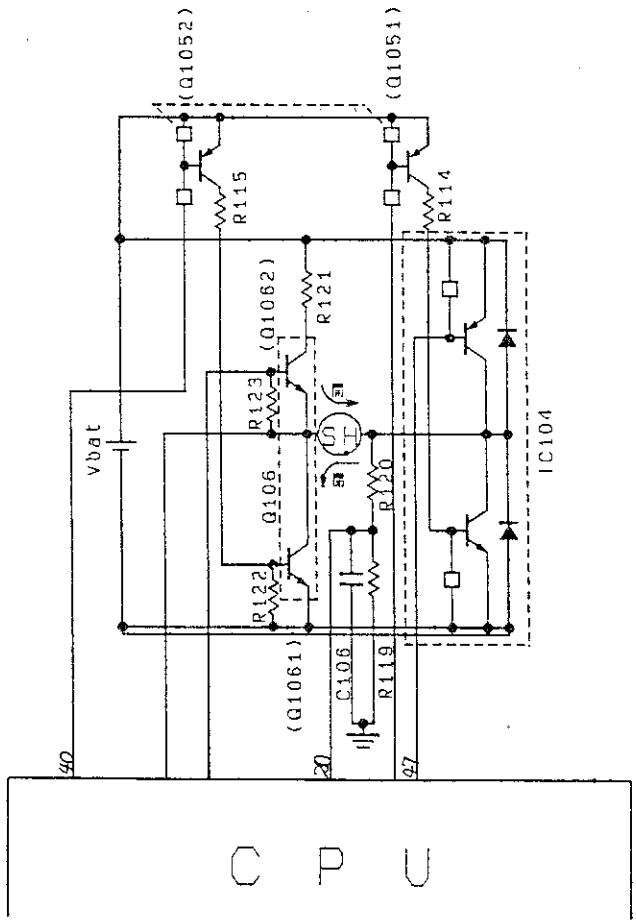
PORT65 (47 pin) =L and PORT76 (40 pin) =L.

Shutter closing voltage is applied and PORT41 (20 pin) line is A/D converted.

Ⅳ. Decision : ① B1 leval=about 2.4V with shutter load

② B2 leval= about 2.2V or below

Ⅴ. Circuit diagram



3. Blank Shots Advance

I . Function : ① Performs analog detection of film perforations directly by the photo reflector.

② Calculates, from the analog values above, an optimum threshold value for film loading and stores it in memory.

③ Controls all winding related operations according to the threshold value.

II . Operation : ① Black shots advance is started at " open → close " of the back cover.
Back Cover Switch is turned "H" → "L"

② The winding photo coupler (WPR) is turned ON (37 pin = L).

③ The winding motor is set for forward run.

④ IC101 receives the analog waveform from WPR · IN at the WIND terminal (22 pin) and calculates and detects the maximum and minimum values from the first eight pulses.

⑤ The detection of the maximum and minimum values is monitored by pulse output at PORT74 (38 pin).

⑥ After determination of the maximum and minimum values, IC101 calculates an optimum threshold values and counts the number of frames according to the value. The detection of the threshold value is monitored by pulse output at PORT72 (36 pin).

⑦ Pulse drive is started at the 7th perforation to slow down the motor.

⑧ The motor is stopped by reverse run (Brake) at the 8th perforation, thus completing the blank shots advance.

III . Control output

Control	Winding	Duty ON	Duty OFF	Brake
Port 60 (42 pin)	L	L	H	H
Port 61 (43 pin)	H (OPEN)	H	H	L
Port 63 (45 pin)	H (OPEN)	H	H	L
Port 64 (46 pin)	L	L	H	H

IV. Circuit diagram

See "Winding / Rewinding".

4. Light Metering Circuit

I . Outline : Light metering data is produced by measuring the integration time of SPD photo-current.

An optimum exposure is determined by spot / ave. metering.

Light metering range is divided into two steps, covering a wide range.

II . Functions : Switches light metering area——→average / spot

Switches light metering range——low brightness (3 to 10EV) / high brightness (10 to 17EV)

III. Output control

Light metering area ① Average ———AE1 (38 pin)= L, AE2 (37 pin)= X

② Spot ———— AE1 (38 pin) =H, AE2 (37 pin) = L

Note : X is either H or L.

Ev area ① Low brithness AE2 (37 pin) = L, AE1 (38 pin) = L

② High britness AE2 (37 pin) = H, AE1 (38 pin) = L

IV. Data input

① Vref is set by DA (12 pin).

② Outputs are aet . (AE1 (38 pin), AE2 (37 pin))

③ The capacitor is discharged (1 msec) by the transistor in IC101 (CPU).

④ The internal timer counts the time till the inversion of the comparator in IC101.

⑤ As a countermeasure against fluorescent lamps, when the inversion time is less than 10 msec, ② to ④ above are repeated until the total inversion time reaches 10 msec and then an average is taken as the light measuring data.

Note :

When the capacitor is charged fully with the internal transistor turned off, the potential of the inversion input line (16 pin) becomes about Vdd +0.3V.

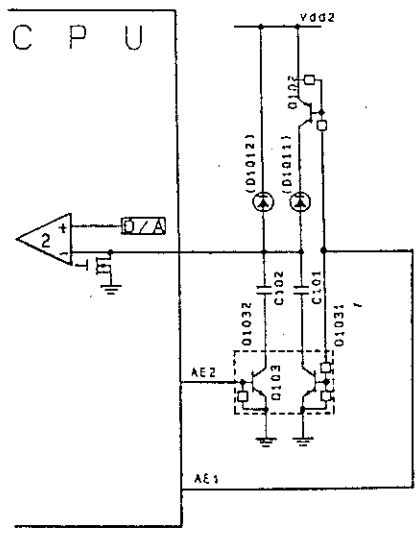
V. Light metering sequence

① Average low brightness average metering

② Average high brightness average metering

③ Spot metering

VI. Circuit diagram



5. AF Circuit

Ⅰ. Outline : ① 3-beam multi-AF

Distance metering range

Center LED---------- 0.35 to 6m

Right and left LEDs---------- 0.7 to 4m

From the 3-beam data, an optimum value is calculated as the distance metering data.

Ⅱ. Operation : ① Any one is selected from three IR-LEDs.

② Serial communication with IC101

(1) Starting of AF IC (IC101→ IC201)

(2) Completion of AF operation AF・DATA (IC201→ IC101)

(3) Trnasfer of AF data AF・DATA (IC201→IC101)

③ ① and ② are perfomed for each LED, whenever necessary.

Ⅲ. Details : ① The center LED is selected by IR-LED serector ("L" ACTIVE).

AF CENTER terminal (42 pin) =L, AF RIGHT terminal (43 pin),LEFT terminal (44 pin) = H

② AF・CNTL (34 pin) is turned "L" and AF IC is started.

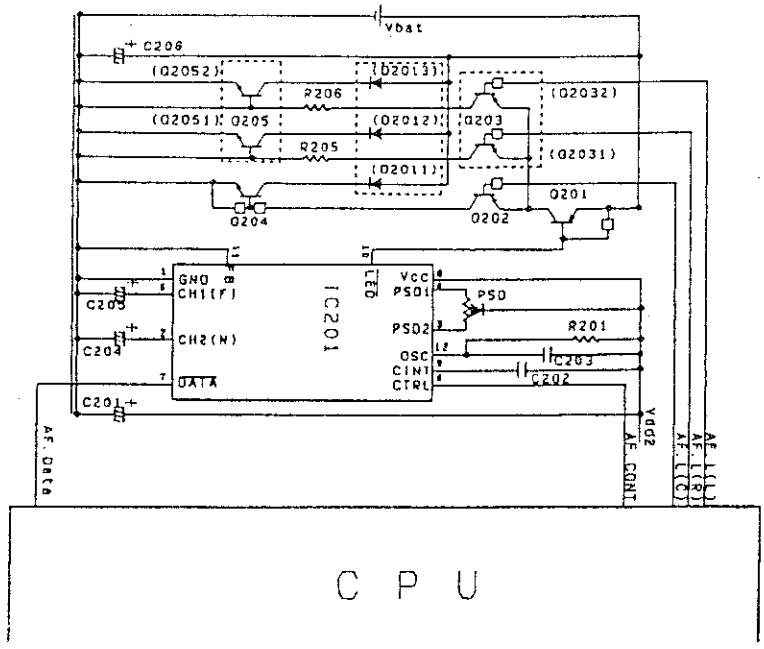
③ Upon completion of AF IC operation, AF・Data line (54 pin) is turned "H"

④ IC101 receives AF data by 8-bit serial communication at the AF・CNTL terminal.

⑤ The "Right" LED is selected by the LED selector. After that, ② to ④ are performed.

⑥ The "Left" LED is selected by the LED selector. After that, ② to ④ are performed.

Ⅳ. Circuit diagram



6. Shutter Drive Circuit

Ⅰ. Functions : ① Controls the rise curve by the voltage regulator circuit.

② Performs temperature compensation of drive voltage.

③ Detects a non-contact blade position by photo reflector.

Ⅱ. Operation : ① The temperature is measured by the thermistor (R108) and the shutter opening voltage data stored in IC103 is corrected.

② OP1 (14 pin) output is set according to the shutter opening voltage data. At the same time, PORT 62 (44 pin) is turned "L " and the shutter opening voltage is applied.

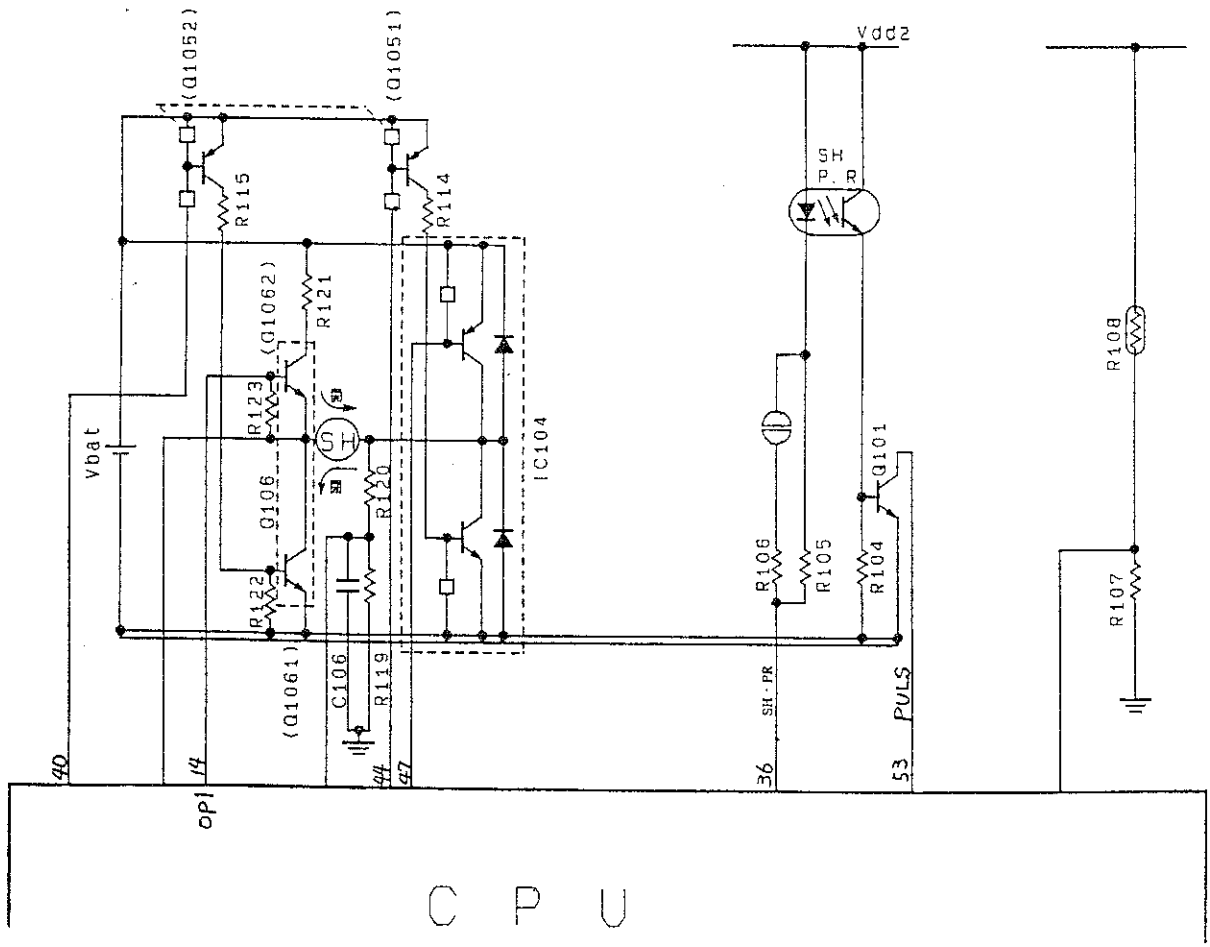
③ SH・PR is turned ON the shutter blade position. (36 pin = L)

④ PORT32 (53 pin) detects the shutter blade position as ahoto coupler signalm (PULS).

⑤ FM and other operations are performed, as required.

⑥ Shutter closing switch is turned ON and the shutter is closed. (PORT65 (47 pin) = L, PORT76 (40 pin) = L)

Ⅲ. Circuit diagram



7. Flash Circuit

I. Function : Activates flash at a selected power using two flash capacitors ——— the sub capacitor (small) and the main capacitor (large).

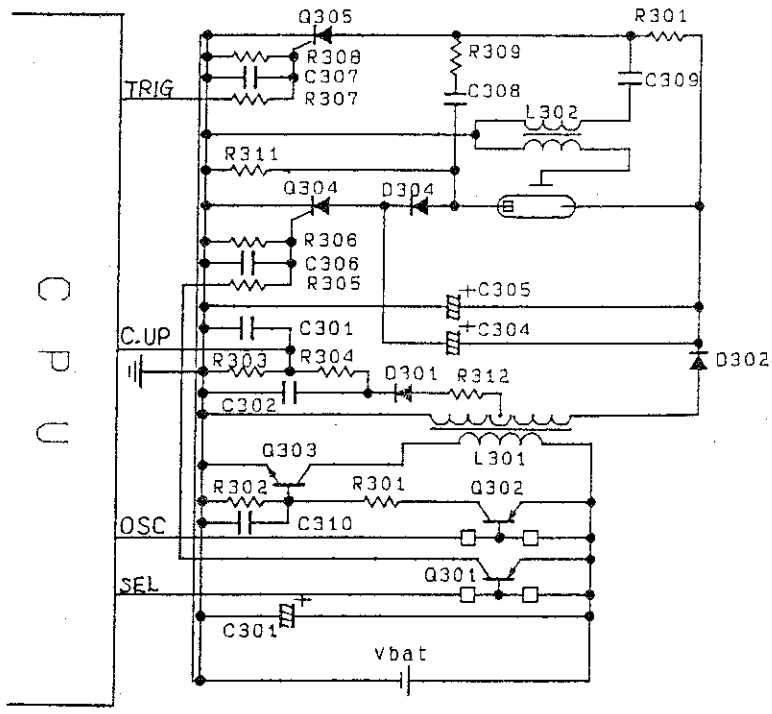
II. Operation : ① Charging --------The SEL terminal (57 pin) is set to "L" the flash unit is subjected to external cscillation (50 Khz) at the OSC terminal (56 pin) to charge the main and sub capacitors.

② Charge check --------The charge voltage is checked at the CPU terminal (19 pin) by A/D conversion. When the CPU line voltage has reached 1.9V (equivalent to 300V charge voltage), charging is completed by turning OFF the OSC oscillation output.

③ Pre-flash or soft flash --------The SEL terminal (57 pin) turns "H" and the TRIG terminal (55 pin) outputs a trigger pulse.
Flash is activated with the sub capacitor only.

④ Full flash --------The SEL terminal turns "L" the TRIG terminal output a trigger pulse. Flsh is activated with both the main and sub capacitors.

III. Circuit diagram



8. Winding / Rewinding

I . Functions : ① performs analog detection of film perforations directly by the photo reflector.

② Controls film advance according to the threshold value calculated at blank shots advance.

II . Operation 1 (Winding)

① The winding photo coupler (WPR) is turned ON (37 pin = L).

② The winding motor is set for forward run.

③ IC101 recevies the analog waveform at the WPR・IN terminal (22 pin) and counts perforrations according to the threshold data.

④ Immediately (One perforration) before the arrival of the third frame, the duty drive is started to slow down the motor.

⑤ The motor is stopped by reverse run (Brake) at the third frame.

III . Operation 2 (Rewinding)

1.Auto return

① Rewinding is started when the film is not wound one frame in two seconds during winding operation.

② The winding motor is set for reverse run.

③ After rewinding to the end, completion of film rewinding is deteced at no perforation change for seven or more seconds and the motor is stopped.

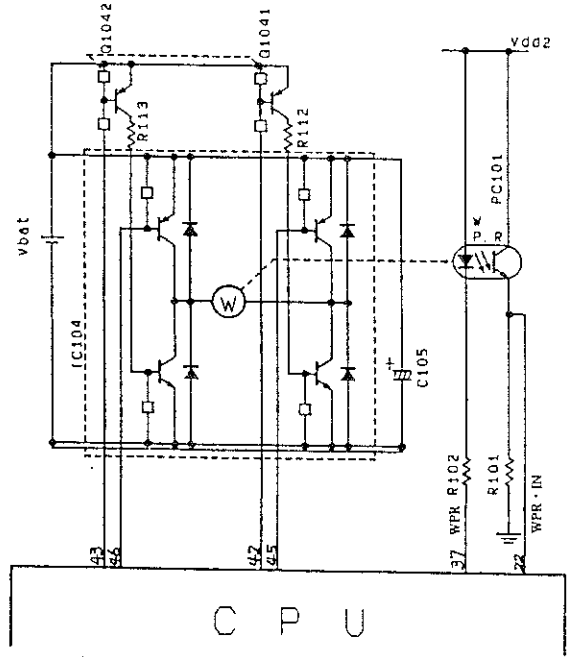
④ Finally the motor is operated forward for 200 msec and the epicyclic gear position is charged, complting rewinding.

2. On-demand rewinding

① When the on-demand rewind butten is pressed, IC101 starts rewinding.

② The subsequent operations are the same as auto return.

IV. Circuit diagram



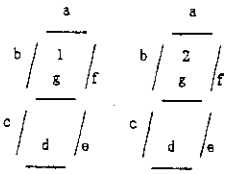
DESCRIPTION OF IC TERMINALS

IC101(CPU)

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
01	SEG7	O	SEG7	2d / 2e LCD drove terminal 1/2 bias 1/2 duty
02	SEG8	O	SEG8	
03	SEG9	O	SEG9	
04	SEG10	O	SEG10	
05	SEG11	O	SEG11	
06	COM2	O	COM2	1a 1e 1f 1g 2a 2e 2f 2g ∞ AUTO
07	COM1	O	COM1	1b 1c 1d 2b 2c 2d
08	Prot20	I	DX0	DX input terminal 0
			REQ	Auto regulation mode: Request signal from regulator to camera
09	Prot21	I	DX1	DX input terminal 1
			C / D	Auto regulation mode : Command / data identification signal
10	Port22	I	DX2	DX input terminal 2
11	Port23	I	L.COV1	Lens cover detection : "L" at open
12	OP1IN+	I		DA reference output
13	OP1IN−	I	C.V	Shutter power feedback input
14	OP1OUT	O	SH.ON	Shutter & light metering reference output
15	COMP2+	I	REF	Light metering referrence input
16	COMP2−	I	AEIN	Light metering integration input
17	Vdd		Vdd 1	CPU power : Operation=3V, Standby= battery voltage
18	Vref		—	CPU analog refrence power
19	Port40	AD	CH.UP	Flash charge completion detect : 1.9V for 300V main capacitor
20	Port41	AD	BATT.C	Battery check input / power-on reset : AF adjustment at 3V
21	Port42	AD	T · C	Temperature detection 25℃=2.5V + 30mV /℃
22	Port43	AD	WPR · IN	Direct processing of analog waveform at winding
23	Port44	I	—	Not used
24	Port45	I	—	Not used
25	RESET	I	RESET	Rest input terminal : Active "L"

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal	
26	TESTIC	I	—	Not used	
27	GND		GND	CPU power GND	
28	CK1	I	—	System clock CR oscillation input	
29	CK2	O	—	System colck CR oscillation output	
30	Port10	I	BCOD1	Retract barrel position detect code 1	Retract = 0,0 Standby = 1,0 AF area = 1,1 Close = 0,1
31	Port11	I	BCOD2	Retract barrel position detect code 2	
32	Port12	I	S2	Release switch : "L" at ON	
33	Port13	I	SD1	Auto regulation mode : Output of serial communication with regulator	
34	Port70	O	AF · CNTL	AFIC control (Start signal & serial communication clock)	
35	Port71	O	PW2	Vdd2 control : Active "L"	
36	Port72	O	SH · PR	Shutter position detect photo coupler LED : "L" at shutter drive	
37	Port73	O	W · PR	Film position detect photo coupler LED : "L" at winding	
			AE2	Range switching at ave. metering : Low brightness "L", high brightness "H"	
38	Port74	O	AF · PC	Retract barrel travel detect photo coupler : "L" at retract barrel drive	
			AE1	Light metering area switching : Ave. "L", Spot "L"	
39	Port75	O	PW3	Indicator LED enable : Active "L"	
40	Port76	O	SH · OFF	"L" at shutter OFF	
41	Port77	O	PW1	Vdd control : "H" at CPU operation, "L" at standby	
42	Port60	O	IRLED (C)	3-beam infrared LED center select : Active "L"	
			MD6	"L" at winding	
43	Port61	O	IRLED (R)	3-beam infrared LED right. select : Active "L"	
			MD5	"L" at rewinding / "L" at retract barrel advance	
44	Port62	O	IRLED (L)	3-beam infrared LED left. select : Active "L"	
			MD4	"L" at shutter opening / "L" at barrel retracting	

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
45	Port63	O	SL · LED	Self-timer LED control : "L" at lighting
			MD3	"L" at rewinding
46	Port64	O	AF · LED	Focus LED control : "L" at lighting
			MD2	"L" at winding / "L" at barrel retracting
47	Port65	O	FL · LED	Flash LED control : "L" at lighting
			MD1	"L" at shutter close / "L" at retract barrel extend
48	Port66	O	ADM	Date imprinting signal : "H" pluse at imprinting
			SD0	Auto regulation mode : Output of serial communication with regulator
49	Port67	O	SCK	Clock for serial communicationwith EEPROM
				Auto regulation mode : Clock for serial communication with regulator
50	Port50	I/O	SDA	Bidirectional data bus for serial communication with EEPROM
51	Prot30	I	L.COV2	Lens cover travel detect timing SW : "L" at power-on
52	Prot31	I	B.COVER	Back cover switch : "L" at open
53	Port32	I	SH · PULS	Shutter & AF photo coupler wave-shaping Output
54	Port33	I	AF · DATA	AF IC serial data output
55	Port51	O	TRIG	Flash trigger : 1ms "H" pules
56	Port52	O	OSC	Flash charging control : External oscillation 50 Khz duty 60% "L"
57	Port53	O	SEL	Flash intensity select : Only sub capacitor = "H" , Full flash = "L"
			ACK	Auot regulation mode : Acknowledge of REQ signal
58	Port00	I	S1	Check switch : "L" at ON
59	Port01	I	TEST	Auto regulation mode : Mode transition terminal, Active "L"
60	Port02	I	S3	Self-timer switch : "L" at ON
61	Port03	I	MODE	Mode change switch : "L" at ON
62	Port04	I	REWIND	On-demand rewind switch : "L" at ON
63	GND		GND	
64	OSCOUT	O	—	Crystal oscillator 32 KHz output

Pin No.	Terminal Name	I/O	Symbol	Descriotion of Terminal		
65	OSCIN	I	—	Crystall oscillator 32KHz input		
66	SEG0	O	SEG0	1c	1g	LCD drive terminal
67	SEG1	O	SEG1	1b	1a	1/2 bias
68	SEG2	O	SEG2	—	1f	1/2 duty
69	SEG3	O	SEG3	1d	1e	
70	SEG4	O	SEG4	2c	2g	
7I	SEG5	O	SEG5	2b	2a	
72	SEG6	O	SEG6	—	2f	

IC102 (Voltage detect IC)

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
1	Vout	O	Vdet	"L" output, IC101 reset, Nch open drain
2	Vin	I	Vdd	Vdd 2.2V or below detect, Hysteresis 1.1V
3	Vss		GND	

IC103 (EEPROM)

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
1	NC			
2	NC			
3	NC			
4	Vss		GND	
5	SDA	I/O	SDA	Bidirectional bus of EEPROM
6	SCL	I	SCK	EEPROM clock input
7	NC			
8	Vcc		Vdd2	

IC104 (MDIC)

Pin No.	Terminal Name	I/O	Symbol	Description of terminal
1	INIL	I	Port62'	1st stage transistor ON at shutter opening or barrel retracting, 0.8V
2	OUT1	O	SH-	Battery voltage at negative terminal opening of shutter motor
3	GND		GND	
4	OUT2	O	NC	
5	IN2L	I	Port61'	1st stage transistor ON at rewinding or retract barrel extend, 0.8V
6	GND		GND	
7	OUT3	O	NC	
8	IN3L	I	Port60'	1st atage transistor ON at winding, 0.8V
9	IN3H	I	Port63'	"L"at rewinding
10	OUT3	O	WI-	Negative terminal of winding motor
11	Vcc		Vbat	
12	IN2H	I	Port64	"L" at winding or barrel reyracting
13	OUT3	O	AF- / WI+	Positve terminal of winding motor / negative terminal of AF motor
14	Vcc		Vbat	
15	OUT1	O	AF+	Positve terminal of AF motor
16	INIH	I	Port65	"L" at reteact barrel extend or shutter close

IC105(Power supply IC)

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
1	Vin		Vbat	IC power, 1.2V or more boosting capacity
2	ON / OFF	I	PW1	IC control terminal "H" : 3V boosting, "L" : battery voltage
3	SEL1	I	Vbat	Standbay output setting "H" : battery voltage "L" : GND
4	SEL2	I	GND	Vout output setting "H" : 5V , "L" : 3V
5	Vout	O	Vdd	Output terminal : 3V at operation, battery voltage at standby
6	Vsw	O	Vsw	Switching regulator output
7	CONT	O	—	Internal switching transistor output
8	Vss		GND	IC power GND

IC201(AF IC)

Pin No.	Terminal Name	I/O	Symbol	Description of Terminal
1	GND			
2	CH2 (N)	I		Stationary light hold capacitor (close distance)
3	PSD2	I		PSD input terminal (close distance)
4	PSD1	I		PSD input terminal (long distance)
5	CH1 (F)	I		Stationary light hold capacitor (long distance)
6	Vcc		Vdd2	AF IC power
7	DATA	O	AF · DATA	AF IC serial data output
8	CTRL	I	AF · CNTL	AF IC control terminal
9	CINT	O		Integration capacitor charge output
10	LED	O		Infrated LED lighting timing control
11	FB	I		Infrated LED constant current feedback, not used
12	OSC	I		Clock for AF IC, CR oscillation32 KHz

DESCRIPTION OF ELECTRIC PARTS

Symbol	Name	Code	Function
IC101	CPU	LU84510	Sequence control Motor drive control Shutter control Battery check LCD / LED lighting Power supply circuit control Flash control AF-IC control EEPROM control Temperrature sensor input Light metering PC control / input Each switch read
IC102	Reset IC	S-80722AN	CPU hard reset
IC103	EEPROM	X2401S-2.7	Backup of status data & adjusted values
IC104	MD-IC	TA8323F	Control of AF motor and winding motor Control of shutter motor (1 / 2)
IC105	Power Supply IC	S8430AF	Power to system (3V generation)
IC201	AF-IC	IR3S76A1	Distance metering IC
Q101	NPN Transistor	2SC1623-6,7	Wave-shaping of AFPC and SHPC
Q102	PNP Transistor	DTA143TK	Light metering area switching
Q103	NPN Transistor 2	FMG8	Light metering range switching
Q104	PNP Transistor 2	FMA5	MD IC pre-driver
Q105	PNP Transistor 2	FMA5	MD IC pre-driver
Q106	NPN-Tr 2-pcs In	FC118	Control of shutter motor
Q107	PNP-Tr 2-pcs In	IMB10	LED lighting control (1 / 2) Power supply Vdd2 control (2 / 2)
Q201	PNP-Tr R In	DTA114GK	IRLED lighting timing driver
Q202	PNP-Tr R In	DTA143TK	IRLED selector (CENTER)
Q203	PNP-Tr 2-pcs R In	FMA3	IRLED selector (RIGHT) (1 / 2) IRLED selector (LEFT) (2 / 2)
Q204	NPN Power Tr R In	2SD2099	IRLED driver (CENTER)

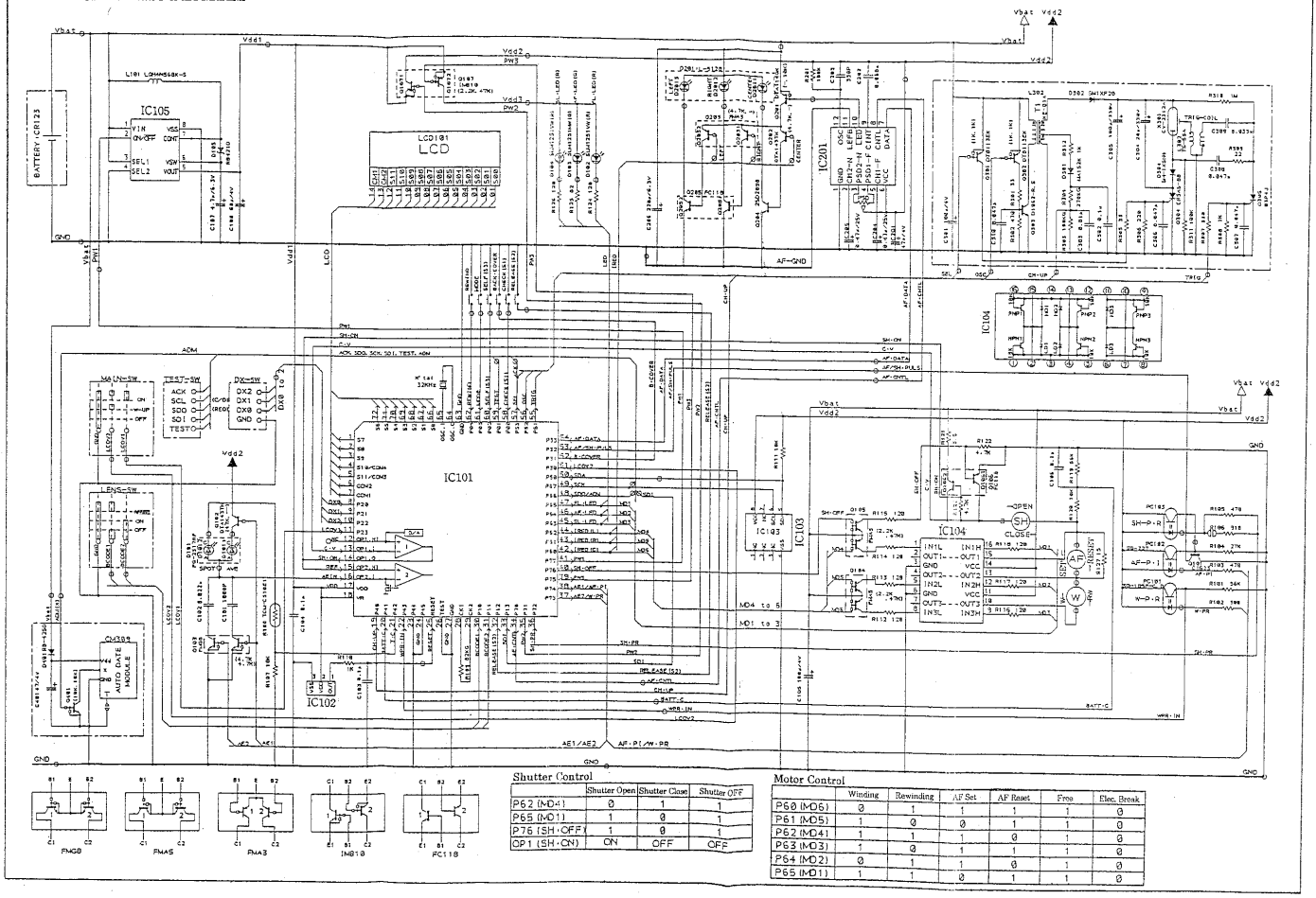
Symbol	Name	Code	Function
Q205	NPN-Tr 2-pcs	FC118	IRLED driver (RIGHT) (1 / 2) IRLED driver (LEFT) (2 / 2)
Q301	PNP-Tr R In	DTB113EK	Capacitor selector pre-driver
Q302	PNP-Tr R In	DTB113EK	Oscillation pre-driver
Q303	NPN-Tr Power	2SD1962-R, S	Oscillation switching transistor
Q304	Thyristor Power	CR5AS	Main thyristor, Capacitor selector
Q305	Thyristor	03P4J	Flash trigger
Q401	NPN-Tr In	DTC114EK	Date imprinting
D101	2-segment SPD	PG-2517RF2DA	Peripheral SPD (1 / 2) Spot SPD (2 / 2)
D102	Chip Red LED	SLM1251VW	Flash indicator
D103	Chip Green LED	SLM1251MW	AF shap focus indicator
D104	Chip Red LED	SLM1251VW	Self timer LED
D105	Schottky Diode	RB421D	Power supply booster switching
D201	Triple IRLED	L5128	Infrared 3-beam for multi-AF
D301	Diode	MA152	Charge voltage detector (Intermediate tap rectifying)
D302	High Voltage Diode	SM1XF20	Transformer secondary side rectifier (High protection against reverse voltage)
D304	Diode	SM1XSN4	Double boosting
D401	Schottky Diode	RB425D	Date module power
R101	Resistor 56K		Winding photo reflector signal detector
R102	Resistor 300		Winding photo reflector LED
R103	Resistor 470		AF photo-interripter LED
R104	Resistor 27K		AF, Shutter PC wave-shaping transistor for base and emitter
R105	Resistor 470		Shutter photo reflector LED
R106	Resistor 910		Shutter photo reflector LED (switching by rank)
R107	Resistor 10K		Temperature sensor reference
R108	Thermistor 10K	TCM-C310E1	Temperature sensor

Symbol	Name	Code	Function
R109	Resistor 82K-G		System clock
R110	Resistor 1K		Reset line delay
R111	Resistor 10K		EEPROM SDA line pull-up
R112	Resistor 120		Motor driver base resistance
R113	Resistor 120		Motor driver base resistance
R114	Resistor 120		Motor driver base resistance
R115	Resistor 120		Motor driver base resistance
R116	Resistor 120		Motor driver base resistance
R117	Resistor 120		Motor driver base resistance
R118	Resistor 120		Motor driver base resistance
R119	Resistor 56K		Battery check voltage divider
R120	Resistor 10K		Battery check voltage divider
R121	Resistor 3.9		Shutter motor transistor protrctor
R122	Resistor 4.7K		Shutter motor transistor base
R123	Resistor 4.7K		Shutter motor transistor base
R124	Resistor 120		Flash LED (red) current limiter
R125	Resistor 82		Focus LED (green) current limiter
R126	Resistor 120		Self timer LED (red) current limiter
R127	Resistor 15	RD16S15J	AF Motor OFF current interceptor
R201	Resistor 100K		AF IC clock
R205			
R206			
R301	Resistor 33		Flsh orimary side oscillation transistor base Resistor
R302	Resistor 470		Flash primary side oscillation transistor between base and emitter
R303	Resistor 100K-G		Flash charge voltage detect voltage divider
R304	Resistor 270K-G		Flash charge voltage detect voltage divider
R305	Resistor 33		Main thyristor, Gate input Resistor
R306	Resistor 220		Main thyristor, Noise remover
R307	Resistor 330		Trigger thyristor, Gte input Resistor
R308	Resistor 1K		Trigger thyristor, noise remover

Symbol	Name	Code	Function
R309	Resistor 22	RD25S22J	Double boosting
R310	Resistor 1M		Trigger voltage
R311	Resistor 100K		Double boosting
R312	Resistor 1K		Flash charge voltage detect ripple remover
C101	Capacitor 1000p		Spot metering photocurrent integration capacitor
C102	Capacitor 0.022		Average high brightness metering photocurrent integration capacitor
C103	Capacitor 0.1		Reset line delay
C104	Capacitor 0.1		CPU bypass capacitor
C105	Aluminum Capacitor 100		For compensating capacitor at Motor drive
C106	Capacitor 0.1		Battery check line smoother
C107	Tantalum Capacitor 4		Power supply IC output Vsw line
C108	Tantalum Capacitor 68		Power supply IC output Vdd line
C201	Tantalum Capacitor 47		AF IC bypass capacitor
C202	Film capacitor 0.068		AF data integration capacitor
C203	Capacitor 330p		AF IC clock
C204	Tantalum Capacitor 0.47		Memory capacitor (long distance)
C205	Tantalum Capacitor 0.47		Memory capacitor (close distance)
C206	Aluminum Capacitor 220		IRLED power
C301	Aluminum Capacitor 100		Flash charging compensation
C302	Capacitor 0.1		Flash charge voltage detect smoothing
C303	Capacitor 0.1		Flash charge voltage detect noise remover
C304	Aluminum Capacitor 20 / 330V		Sub capacitor (Pre-flash)
C305	Aluminum Capacitor 100 / 330		Main capacitor

Symbol	Name	Code	Function
C306	Capacitor 0.047		Main thyristor gate noise remover
C307	Capacitor 0.047		Trigger thyristor gate noise remover
C308	Film Capacitor 0.047		Double boosing
C309	Film Capacitor 0.033		Flash trigger
C310	Capacitor 0.047		Oscillation switching transistor between base and emitter
C401	Tantalum Capacitor 47		Data module memory for power
L101	Coil 56 μ	LQH4N560K-S	Switching regulator
L301	Oscillation Transformer	KE-01A	Flash booster
L302	Trigger coil	TS-55A	Flash trigger
PC101	Photo-Reflector	SG-105F-C,D	Film winding signal detector
PC102	Photo-Interrupter	SG-227	Retract barrel extend stop control
PC103	Incorporated in shutter unit		Shutter blade position detector
X'tal	Crystal, Oscillator		Sub clock 32KHz
PSD	PSD	S4584	AF Sensor
M1	Incorporated in winding unit		Film winding DC motor
M2	DC Motor	LA12-344D	Retract barrel extend
M3	Incorporated in shutter unit		Shutter blade drive (Iris motor)
Xe Tube	Xenon Tube	CY-2312A	Flash activation
LCD	Indication LCD	T359015	Indicator Function

SCHEMATIC DIAGRAM



Shutter Control

	Shutter Open	Shutter Close	Shutter OFF
P62 (MD4)	0	1	1
P65 (MD1)	1	0	1
P76 (SH-OFF)	1	0	1
OP1 (SH-ON)	ON	OFF	OFF

Motor Control

	Winding	Rewinding	AF Set	AF Reset	Free	Elec. Break
P60 (MD6)	0	1	1	1	1	0
P61 (MD5)	1	0	0	1	1	0
P62 (MD4)	1	1	1	0	1	0
P63 (MD3)	1	0	1	1	1	0
P64 (MD2)	0	1	1	0	1	0
P65 (MD1)	1	1	0	1	1	0

B. DISASSEMBLY & REASSEMBLY PROCEDURES

[Notes on Repair]

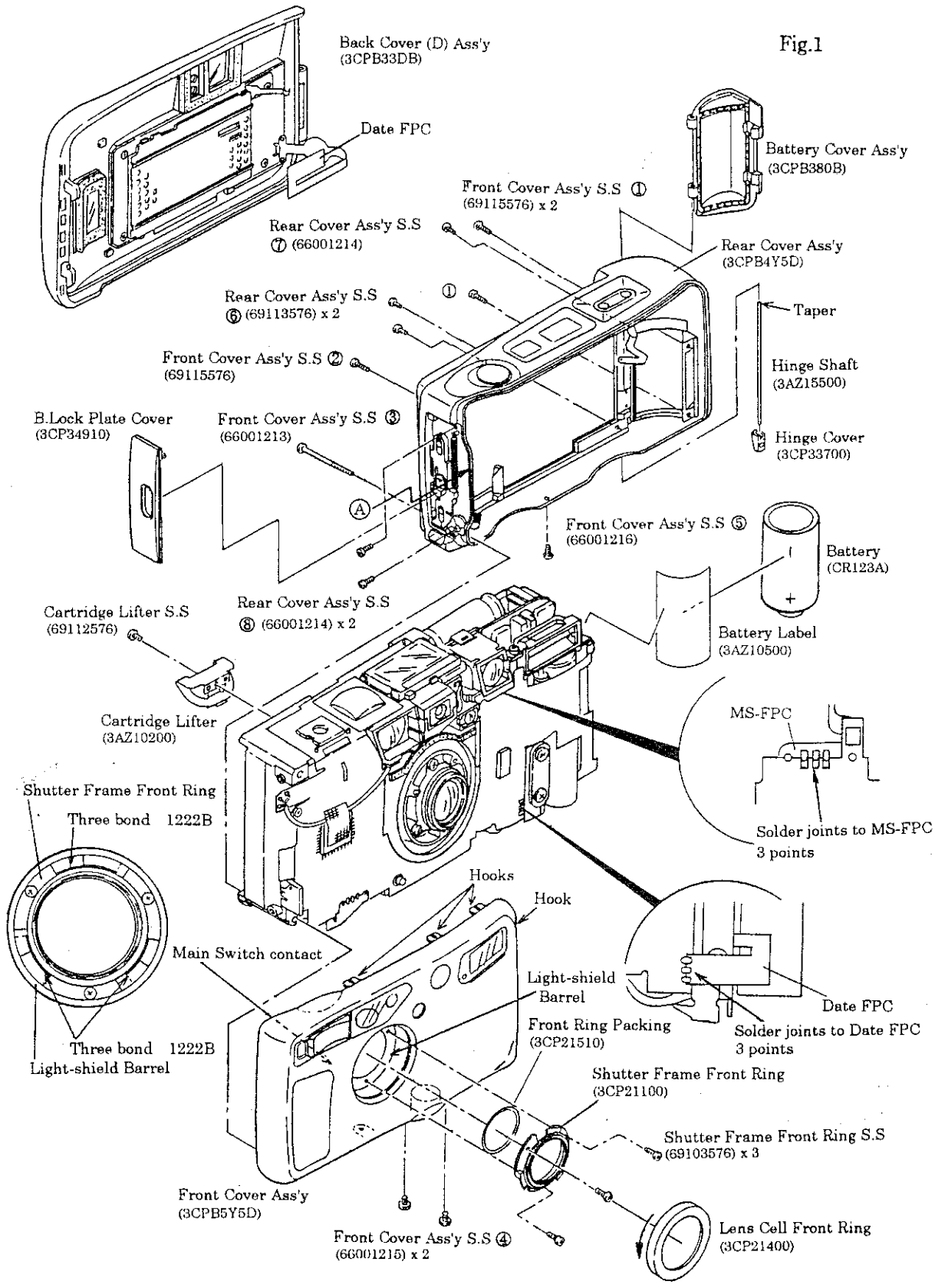
a) Since this product has various models in the product name and the color of Body according to the export destination, please be award that the part numbers used in this Repair Manual are for YASHICA T5 (D) BLACK. Individual part numbers per destinations to be referred in the Assembling Chart.

b) Since this product has the weather proof constitution, shielding is applied for Front Cover Ass'y, Rear Cover Ass'y, Back Cover Ass'y, Back Cover (D) Ass'y and Battery Cover Ass'y, it is not allowed to disassemble the parts other than described in the Assembling Chart.
The individual parts other than described in the Assembling Chart will not be supplied and required to be replaced per an assembled unit.

B-1 Removal of Exterior Parts

[REMOVAL OF EXTERIOR PARTS]

Fig.1



B-1-1 Removal of Front Cover Ass'y (See Fig.1)

1) Rotate the Lens Cell Front Ring (3CP21400) in the direction of the arrow (counterclockwise) by 120 degree and remove the Lens Cell Front Ring.
2) Remove the Shutter Frame Front Ring Setscrews (69103576) x 3. Then, remove the Shutter Frame front Ring (3CP21100) and the Front ring Packing (3CP21510).
3) Open the Battery Cover (3CPB380B) using a coin-like tool. Remove the Battery (CR123A).
4) Peel off the Battery Label (3AZ10500) inside the battery chamber and remove the Front Cover Ass'y Setscrews (69115576) x 2 ①.
5) Open the Back Cover (D) Ass'y. Remove the Cartridge Lifter Setscrew (69112576) and the Cartridge Lifter (3AZ10200).
6) Remove the Front Cover Setscrews (69115576) ② and (66001213) ③.
7) Remove the Front Cover Ass'y Setscrews (66001215) x 2 ④ and (66001216) ⑤. Remove the Front Cover Ass'y (3CPB5Y5D) forward.

Notes:

a) Since the Lens Cell Front Ring (3CP21400) is glued by a bond (Cemedine 551) on its back, be careful when removing the Lens Cell Front Ring. (See Fig.3)
b) For the weather proof constitution, the Shutter Frame Front Ring (3CP21100) is sealed (by Three bond 1222B) at 3 portions. (See Fig.1)
When assembling the Shutter Frame Front Ring, apply the shielder (Three bond 1222B) at the specified portions.
c) When removing the Front Cover Ass'y, be careful on the hooks of the Front Cover, 3 on the top and 1 on the right side.
d) Be careful not to deform the Main Switch Contact during removing the Front Cover Ass'y.
e) For the weather proof constitution, a special synthetic Nylon resin is applied for the Front Cover Ass'y Setscrews (66001215) x 2 ④ and (66001216) ⑤. Don't use the removed screws again and replace with new ones.
The Front Cover Ass'y Setscrews (66001215) ④ and (66001216) ⑤ should be stored in a lower temperature than 20 degree C (in a refrigerator). The synthetic Nylon resin will cause the screws stick together under the temperature higher than 20 degree C.

[Removing the Lens Cell Front Ring]

a) The Lens Cell Front Ring is in a bayonet style. Remove the Lens Cell Front Ring turning 120 degree counterclockwise at the lens closest position (the position where the lens is extended forward most).
b) If the camera was not powered ON (not work), drill two holes diagonally on the Lens Cell Front Ring and turn it 120 degree counterclockwise by a tweezers-like tool hooked in the two holes. The drilled Lens Cell Front Ring should be threw away.

[Setting of the Lens at the closest position]

1) Open the Battery Cover Ass'y using a coin-like tool (leave the Battery in the battery chamber).
2) Set the Main Switch Lever at the "ON" position.
3) Aim the camera to the subject at the closest position.
4) The Release Button is depressed all the way. And then remove the Battery at the moment of the Lens extension and the Shutter operation. The Lens will stop at the closest position.

[Checking of the Shutter operation under the condition of the Front Cover Ass'y removed]

a) Short the circuit by applying a solder at the portion described in Fig.2 in order to make the camera operate while removing the Front Cover Ass'y.

[Notes on Reassembly of Front Cover Ass'y]

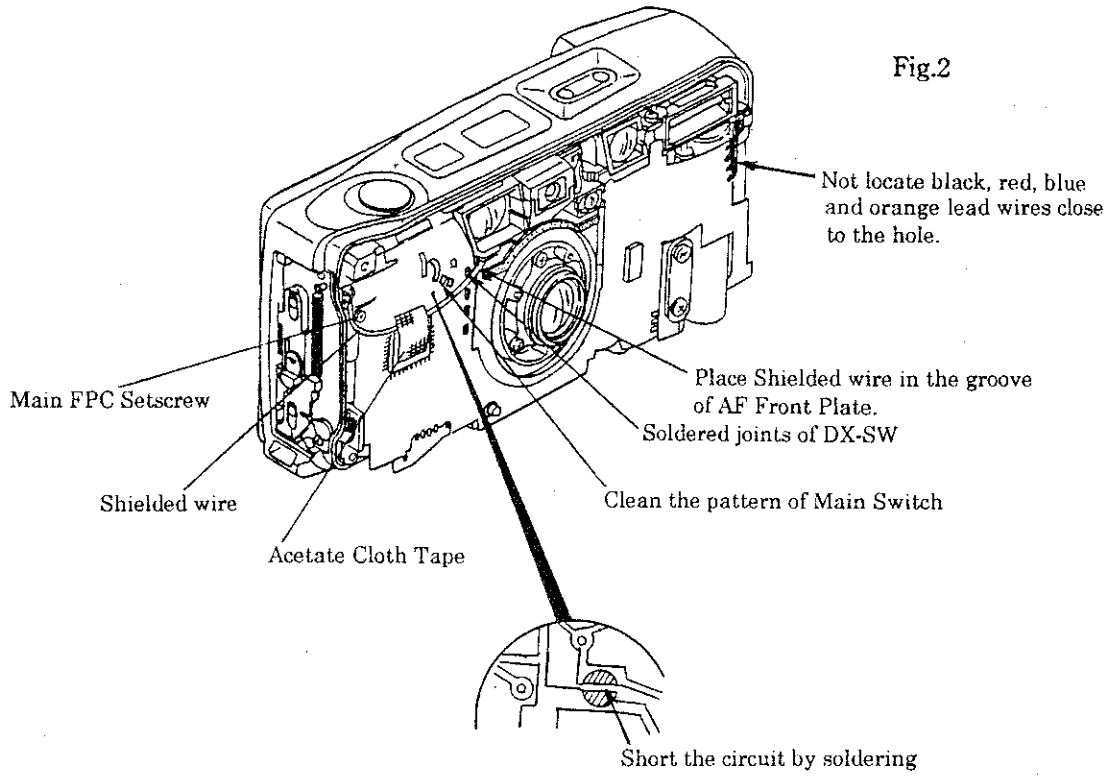
* Make sure the followings when reassembly the Front Cover Ass'y. (See Fig.2)

a) Before installing the Front Cover Ass'y, make sure to remove the shorted solder for checking the Shutter function.
b) Before installing the Front Cover Ass'y, make sure that the shielded wire does not come on the AF Front Plate and be placed in the groove of the AF Front Plate.
c) Make sure that the shielded wire does not come on the Setscrews for CPU or Main FPC.
d) Fasten the shielded wire with Acetate Cloth Tape so that the wire never comes in contact with the soldered joints of DX-SW and the pattern of the Main Switch.
e) Wipe the pattern of the Main Switch with a lens cleaning paper with ether alcohol.
f) Be careful that black, red, blue and orange lead wires at the right side of Body never locate close to the hole.

[Check after Reassembly of Front Cover Ass'y]

a) After installing the Front Cover Ass'y, make sure that the Front Cover Ass'y and the Rear Cover Ass'y are intimately contacted. If there is a gap between, reduce the gap by pushing the front Cover Ass'y.

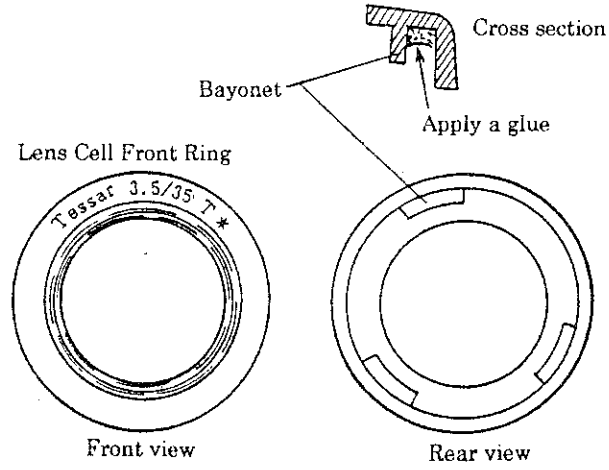
Fig.2


Not locate black, red, blue and orange lead wires close to the hole.
Main FPC Setscrew
Place Shielded wire in the groove of AF Front Plate.
Soldered joints of DX-SW
Shielded wire
Clean the pattern of Main Switch
Acetate Cloth Tape
Short the circuit by soldering

[Notes on Reassembly of Lens Cell Front Ring]

a) Before installing the Lens Cell front Ring, apply a bond (Cemedine 551) at one portion of the bayonet on the back of Lens Cell Front Ring.
b) After setting the Lens at the closest position, turn the Lens Cell Front Ring 120 degree clockwise until it stops.
c) Make sure that the silk printed letters of "Tessar 3.5/35 T*" locate right above when the Lens Cell Front Ring was installed.

Fig.3



B-1-2 Removal of Back Cover (D) Ass'y (See Fig.1)

1) Unsolder the 3 soldered joints between the Date FPC and the Main FPC.
2) Remove the Hinge Cover (3CP33700) and pull out the Hinge Shaft (3AZ15500). Remove the Battery Cover Ass'y (3CPB380B) and the Back Cover (D) Ass'y (3CPB33DB).

Notes:

a) The Hinge Cover (3CP33700) is fixed by a bond (Cemedine 551).
b) Non-date camera does not require the step 1) above.
c) Neglecting the above step 2) and conducting the following procedure B-1-3 enables to remove the Back Cover (D) Ass'y, the Battery Cover Ass'y, and the Rear Cover Ass'y together in one unit.

B-1-3. Removal of Rear Cover Ass'y (See Fig.1)

1) Unsolder the 3 soldered joints between the MS-FPC and the Main FPC.
2) Remove the Rear Cover Ass'y Setscrews (69113576) x 2 ⑥ and (66001214) ⑦.
3) Remove the B.Lock Plate Cover (3CP34910) and the Rear Cover Ass'y Setscrews (66001214) x 2 ⑧. Remove the Rear Cover Ass'y (3PCB4Y5D) from the battery-cover-side first while lightly pressing the portion A of the Body Rear Cover B. Switch side backwards.

Notes:

a) The MS-FPC is fixed by Double stick tape between the Main FPC and the Body.
b) The B.Lock Plate Cover (3CP34910) is fixed by a bond (Cemedine 551) at its top and bottom. (See Fig.5)
c) For the weather proof constitution, a special synthetic Nylon resin is applied for the Rear Cover Ass'y Setscrews (66001214) x 3 ⑦ ⑧. Don't use the removed screws again and replace with new ones.

   The Rear Cover Ass'y Setscrew (66001214) ⑦ should be stored in a lower temperature than 20 degree C (in a refrigerator).
d) Be careful not to deform the B. Switch Contact (3CP35310) on the Rear Cover Ass'y when removing the Rear Cover Ass'y. (See Fig.5)
e) Take care not to avoid break the MS-FPC during removing. Removing of the Rear Cover Ass'y without unsoldering 3-soldered joints between the MS-FPC and the Main FPC may cause the break.

[Discharging Flash Capacitor]

Caution:
Since the Main Capacitor and the Sub Capacitor have been kept at a very high voltage by the flash circuit, be sure to perform discharging the capacitors according to the following procedure when removing the Rear Cover Ass'y. (See Fig.5)

1) Connect the electrodes of the discharge tool to the soldered part of green lead wire and orange lead wire of the Sub Capacitor, and discharge the capacity.
2) Connect the electrodes of the discharge tool to the soldered part of orange lead wire of the Sub Capacitor and GND, and discharge the capacity of the Main Capacitor.
3) Conduct the step 1) above again, and discharge the capacity of the Sub Capacitor.

[Reassembly of Back Cover (D) Ass'y and Rear Cover Ass'y] (See Fig.4 & 5)

1) Set the B.Lock Plate at the lock condition.
2) Pull out the MS-FPC in the direction of the arrow shown in Fig.5 and hold on the Rear Cover Ass'y.
3) Install the Body from the B.Switch Contact side to the Rear cover Ass'y. Take care of the B.Switch Contact and the Release Button while reassembling.
4) Pull the MS-FPC out from the space between the Viewfinder Base and the Flash reflector.
5) Fix the MS-FPC to the Body with Double stick tape while engaging two holes of the MS-FPC to the guide pins on the Body.
6) Fix the Main FPC on the 5) with Double stick tape while engaging two holes of the Main FPC to the guide pins on the Body.
7) Solder the MS-FPC to the Main FPC at 3 soldering joints.
8) Tighten the Rear Cover Ass'y Setscrews (66001214) x 2 ⑧.
9) Lead the end of the Date FPC of the Back Cover (D) Ass'y (3CPB33DB) between the Rear Cover Ass'y and Body. Engage two holes of the Date FPC to the pins on the Body and fix it with Double stick tape. Lead the end of the Date FPC between the Main Capacitor and the Body, and place it on the front.

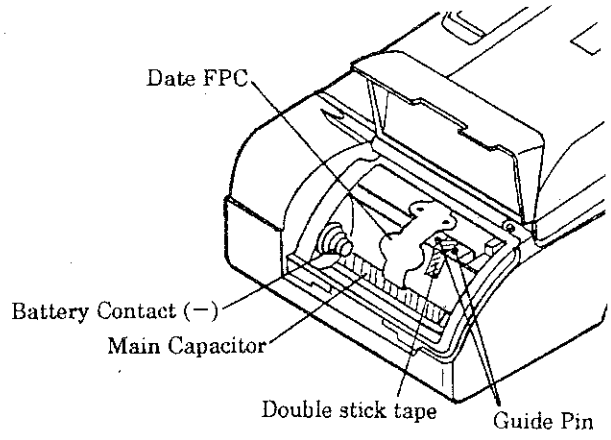


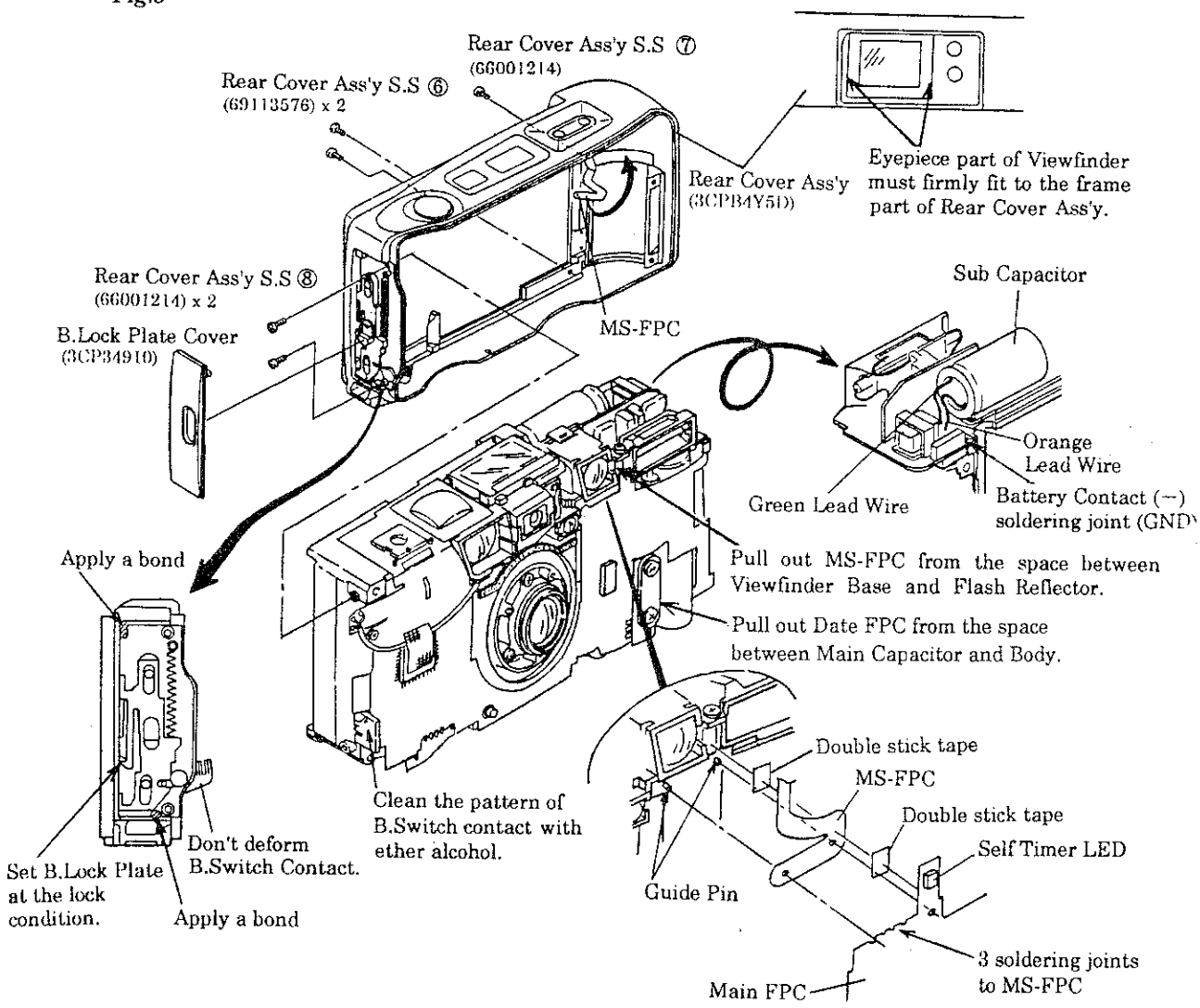
Fig.4

10) Pull out the Date FPC to front side of the Body, and solder it to the Main FPC.
11) Tighten the Rear Cover Ass'y Setscrews (66001214) ⑦ and (69113576) x 2 ⑥.
12) Engage the hole of the Back Cover (D) Ass'y to the hole of the Battery Cover (3CPB380B), and insert the Hinge Shaft (3AZ15500) to the hole from the taper end. (See Fig.1)
13) Apply a bond (Cemedine 551) to the Rear Cover Ass'y at two portions, and stick the B.Lock Plate Cover (3CP34910).

Note :

Make sure that the eyepiece part of the Viewfinder keeps firm fit with the frame part of the Rear Cover Ass'y. If there is a gap between, the Body and the Rear Cover Ass'y have not been assembled correctly. Make sure the correct fit by pressing the Body and the Rear Cover Ass'y again to reduce the gap.

Fig.5


Rear Cover Ass'y S.S ⑦
(66001214)
Rear Cover Ass'y S.S ⑥
(69113576) x 2
Rear Cover Ass'y
(3CPB4Y50)
Eyepiece part of Viewfinder must firmly fit to the frame part of Rear Cover Ass'y.
Rear Cover Ass'y S.S ⑧
(66001214) x 2
B.Lock Plate Cover
(3CP34910)
MS-FPC
Sub Capacitor
Orange Lead Wire
Green Lead Wire
Battery Contact (−) soldering joint (GND)
Apply a bond
Pull out MS-FPC from the space between Viewfinder Base and Flash Reflector.
Pull out Date FPC from the space between Main Capacitor and Body.
Double stick tape
MS-FPC
Double stick tape
Self Timer LED
Clean the pattern of B.Switch contact with ether alcohol.
Guide Pin
Don't deform B.Switch Contact.
Set B.Lock Plate at the lock condition.
Apply a bond
3 soldering joints to MS-FPC
Main FPC

B-2 Removal of AF Base w/ Main FPC Ass'y

Caution:
This camera may be loaded with various version of the Main FPC Ass'y under the storategy of quality improvement. Since this Repair Manual describes for the new type product, please refer to the description in Page B-13 regarding the repair of old type products.

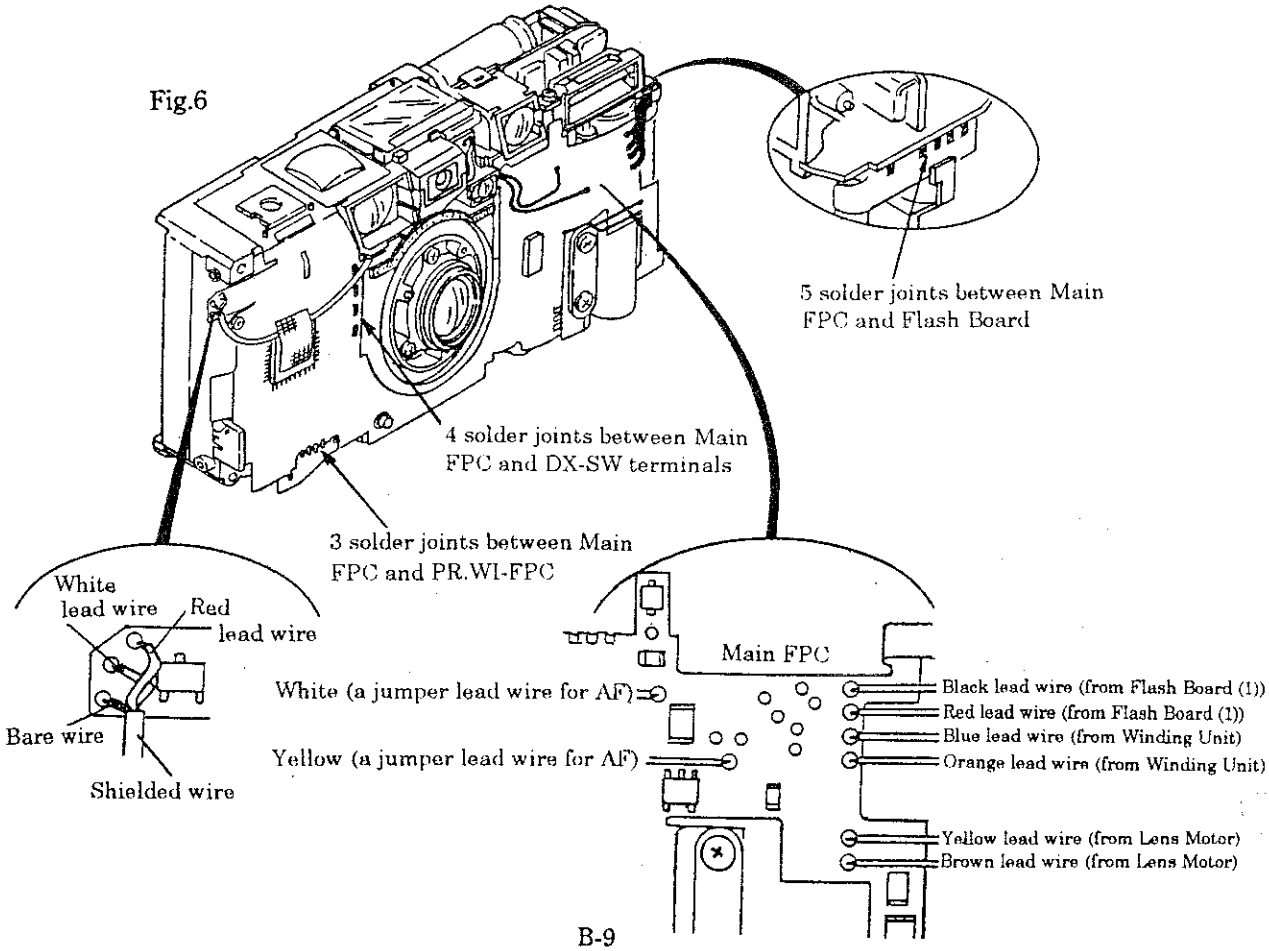
B-2-1. Removal of the AF Base w/ Main FPC Ass'y (See Fig.6)

1) Unsolder the 5 soldered joints between the Main FPC and the Flash Board.
2) Unsolder the 6 lead wires on the Main FPC.

Black lead wire (from Flash Board (1))	Red lead wire (from Flash Board (1))
Blue lead wire (from Winding Unit)	Orange lead wire (from Winding Unit)
Yellow lead wire (from Lens Motor)	Brown lead wire (from Lens Motor)

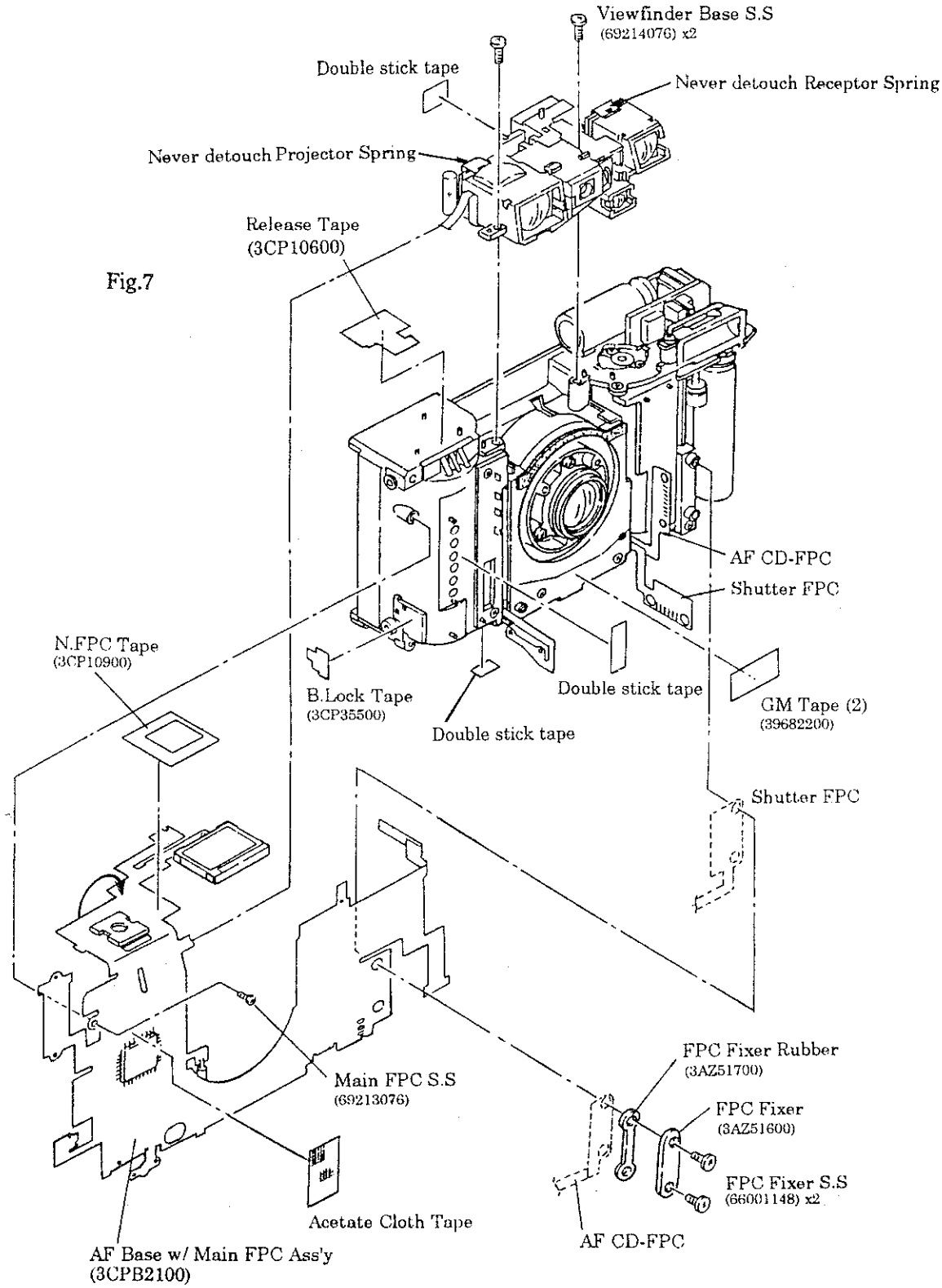
3) Unsolder the white and the yellow lead wires on the Main FPC.
   * The white and the yellow lead wires are jumper wires. However, because of an easy forming of the AF Base w/ Main FPC Ass'y, unsolder the white and the yellow lead wires instead.
4) Unsolder the 3 cores (red, white, and bare lead) of the shield wire on the Main FPC.
5) Unsolder the 3 soldered joints between the Main FPC and the PR.WI-FPC.
6) Unsolder the 4 soldered joints between the Main FPC and the DX-SW terminals.

Fig.6


5 solder joints between Main FPC and Flash Board
4 solder joints between Main FPC and DX-SW terminals
3 solder joints between Main FPC and PR.WI-FPC
White lead wire
Red lead wire
Bare wire
Shielded wire
Main FPC
White (a jumper lead wire for AF)
Yellow (a jumper lead wire for AF)
Black lead wire (from Flash Board (1))
Red lead wire (from Flash Board (1))
Blue lead wire (from Winding Unit)
Orange lead wire (from Winding Unit)
Yellow lead wire (from Lens Motor)
Brown lead wire (from Lens Motor)

[REMOVAL OF AF BASE with MAIN FPC ASS'Y]

Fig.7



7) Remove the FPC Fixer Setscrews (66001148) x 2, FPC Fixer (3AZ51600) and FPC Fixer Rubber (3AZ51700).
8) Peel off the Main FPC in the direction of the arrow and remove Viewfinder Base Setscrews (69214076) x 2.
9) Peel off the Acetate Cloth Tape.
10) Remove the Main FPC Setscew (69213076) and the AF Base w / Main FPC Ass'y (3CPB2100).

Note:
The Main FPC is fixed to the body with a Double stick tape. In case of peeling it off, therefore, take care not to break the pattern on the Main FPC. (See Fig.7)

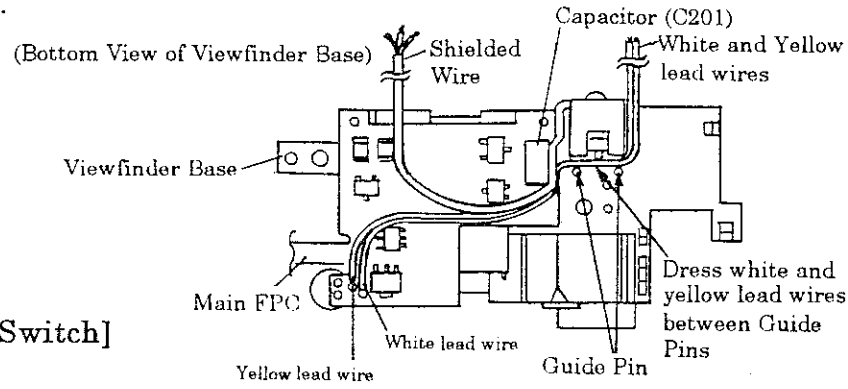
[Notes on Handling of AF Base w/ Main FPC Ass'y]

* Never separate the Main FPC and the Viewfinder Ass'y.
  Never move the Projector Spring (for AF-LED positioning) and the Receptor Spring (PSD positioning).
  The AF-LED positioning and the PSD positioning are completed in the factory and impossible in the service area. In case of the unit defective, whole of the AF Base w/ Main FPC Ass'y (3CPB2100) should be replaced.

[Dressing of AF Lead Wires and Shielded Wires]

* When installing the Viewfinder Base to the body, lead the AF lead wires (white and yellow) and the shielded wire under the Viewfinder Base and pull out to the front side of body as shown in Fig.8.

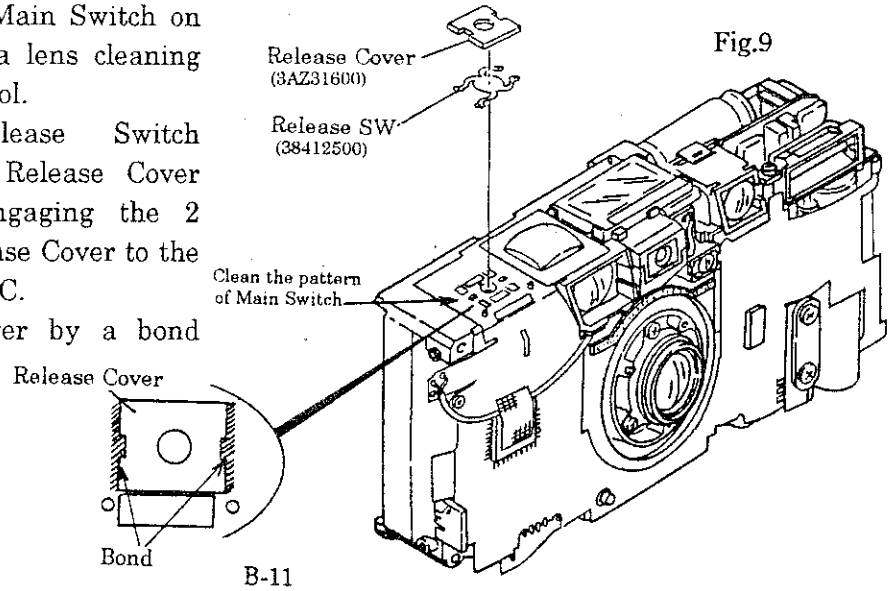
Fig.8



[Assembly of Release Switch]

1) Wipe the pattern of Main Switch on the Main FPC with a lens cleaning paper with ether alcohol.
2) Assemble the Release Switch (38412500) and the Release Cover (3AZ31600) while engaging the 2 guide pins of the Release Cover to the 2 holes of the Main FPC.
3) Fix the Release Cover by a bond (Cemedine 551).

Fig.9



[Forming of Main FPC Ass'y]

When replacing the AF Base w/ Main FPC Ass'y, form the new FPC as shown below and install it.

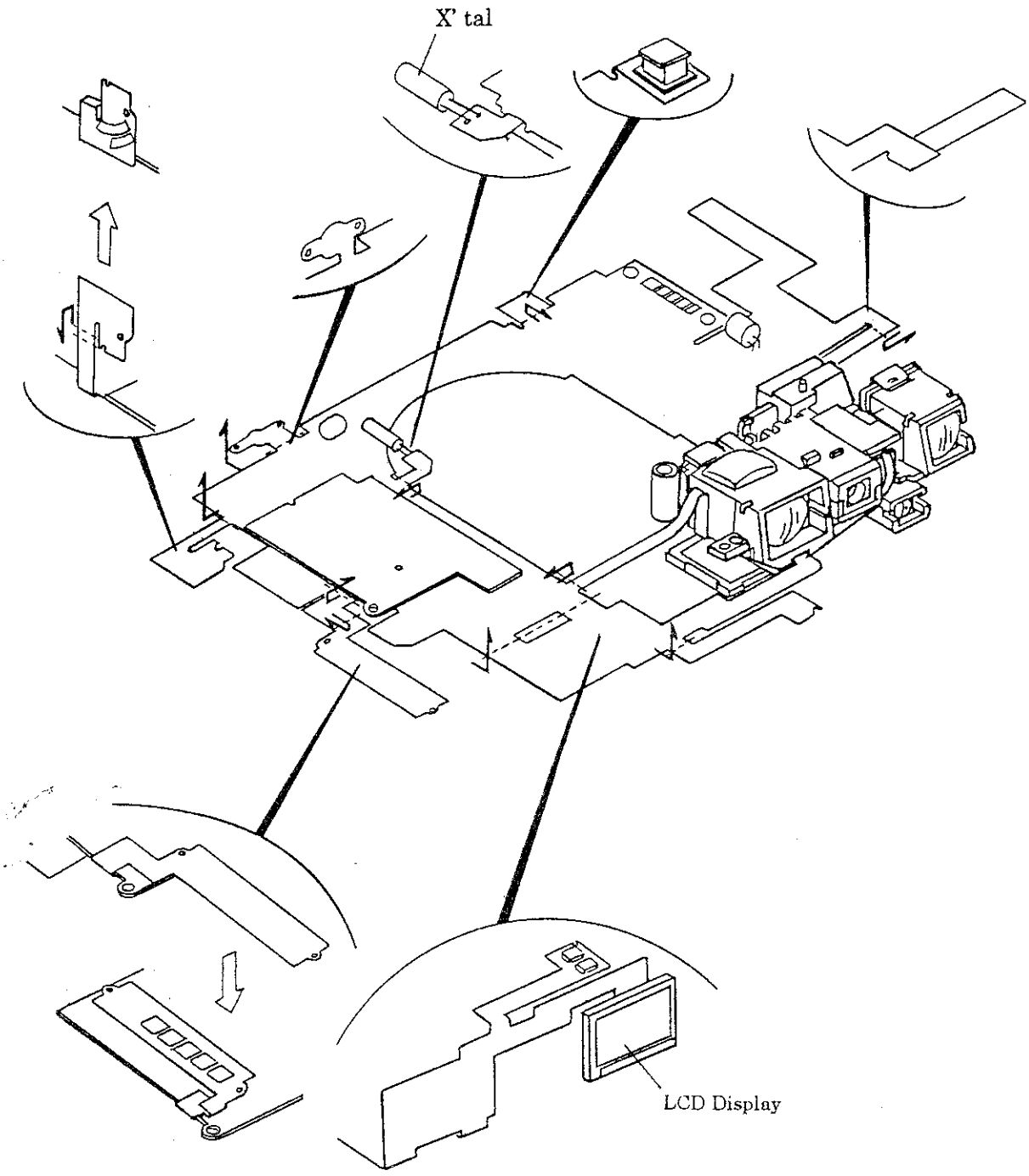


Fig.10

[As for the old type Main FPC Ass'y]

(1) Compensation Board (M Board)

When repairing an initially released product, take care of the Compensation Board which has been added on the Winding Circuit for improve the winding accuracy.
The Compensation Board (M Board) has been omitted in the new type product by improving CPU (IC-1).

(2) Handling of Repair

a) The M Board will not be supplied due to not stock.
b) The M Board will not be included in the new Main stick FPC Ass'y when supplied. When replacing the Main FPC Ass'y to new one, remove the M Board.
c) The M Board is fixed on the body by a Double stick tape.

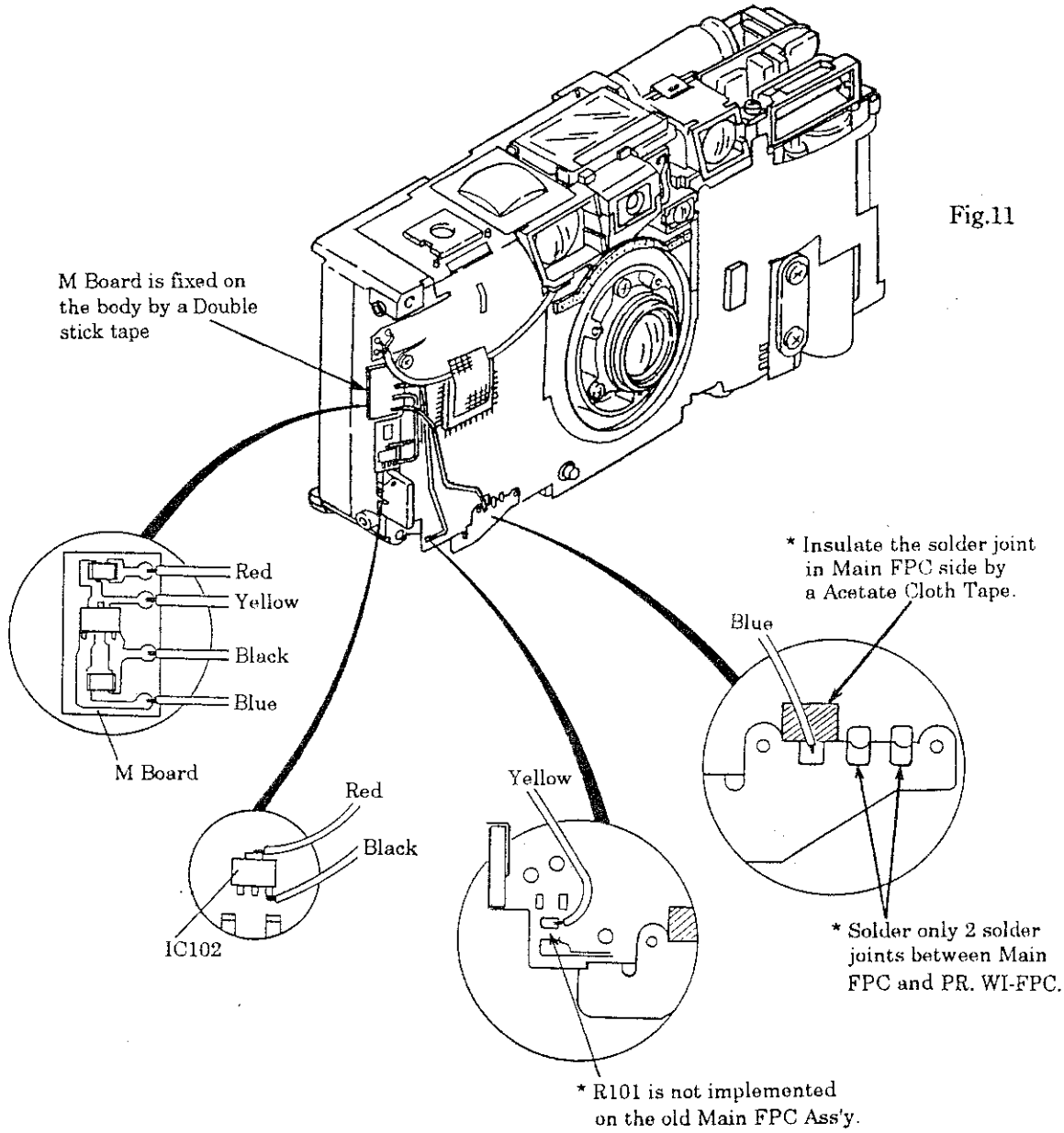

M Board is fixed on the body by a Double stick tape
Red
Yellow
Black
Blue
M Board
Red
Black
IC102
Yellow
* R101 is not implemented on the old Main FPC Ass'y.
* Insulate the solder joint in Main FPC side by a Acetate Cloth Tape.
Blue
* Solder only 2 solder joints between Main FPC and PR. WI-FPC.

Fig.11

(3) Wiring Diagram

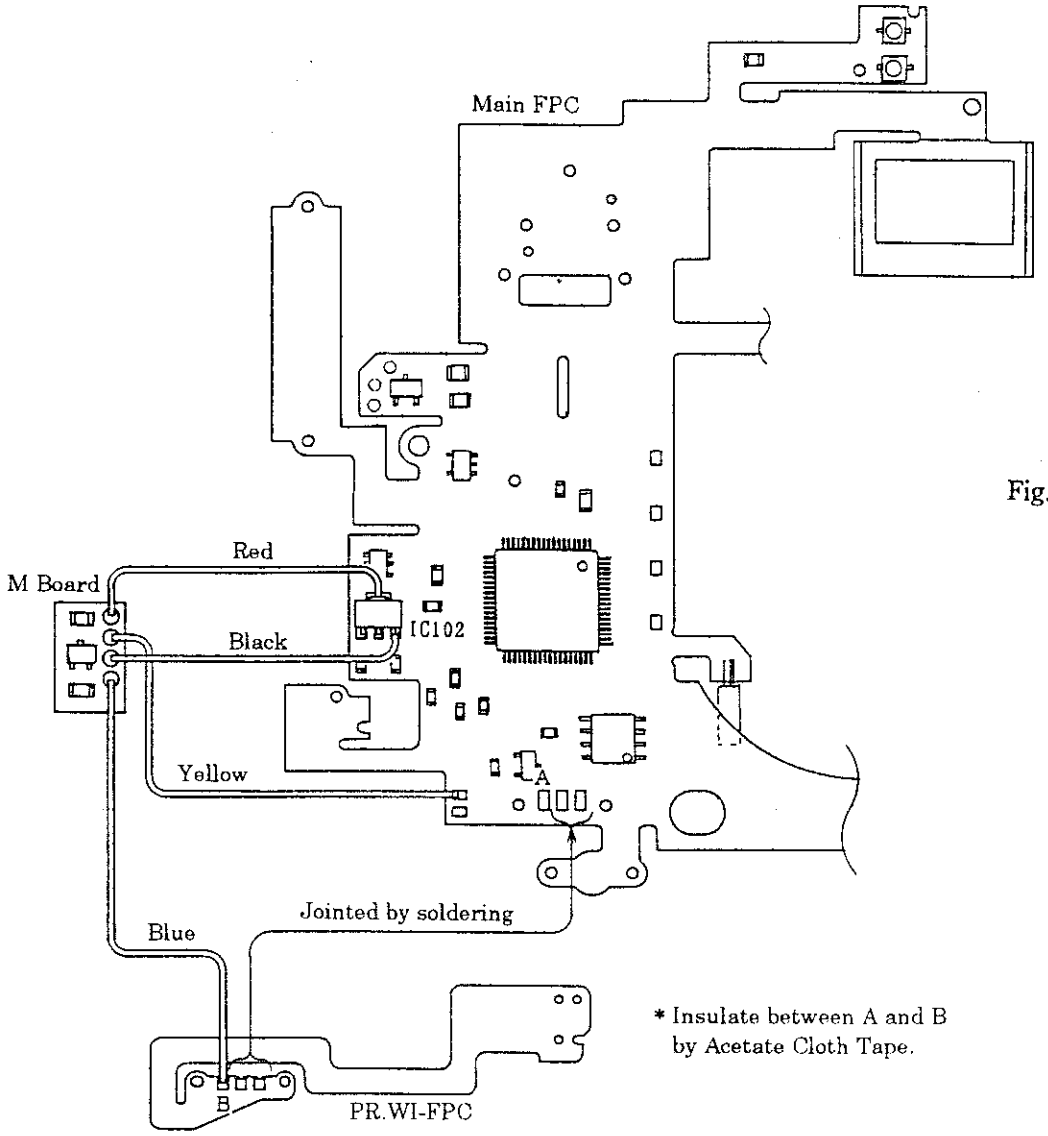


Fig.12

B-3 Removal of Flash Ass'y

B-3-1. Removal of Flash Ass'y (See Fig.13)

1) Unsolder the soldered joint between the Battery Contact (−) (3AZ10410) and the Flash Board (1) and then remove the Battery Contact (−).
2) Unsolder the soldered joint between the Battery Contact (+) (3AZ10320) and the Flash Board (1).
3) Remove the Flash Board Setscrews (69213076) and (69102576), and then remove the Flash Ass'y (3AZAE300).

Note:
The Sub Capacitor is fixed to the Winding Unit by Double stick tape. Take care of removing the Sub Capacitor.

[Notes on Reassembly of Flash Ass'y]

a) When assembling the Flash Ass'y, be careful not to be pinched the blue and orange lead wires (from the Winding Motor) between the Flash Board and the Winding Unit, and lead them through the cut out of the Flash Board (1).
b) Make sure that the Flash Board (1) is hooked to the slit of the Flash Base.

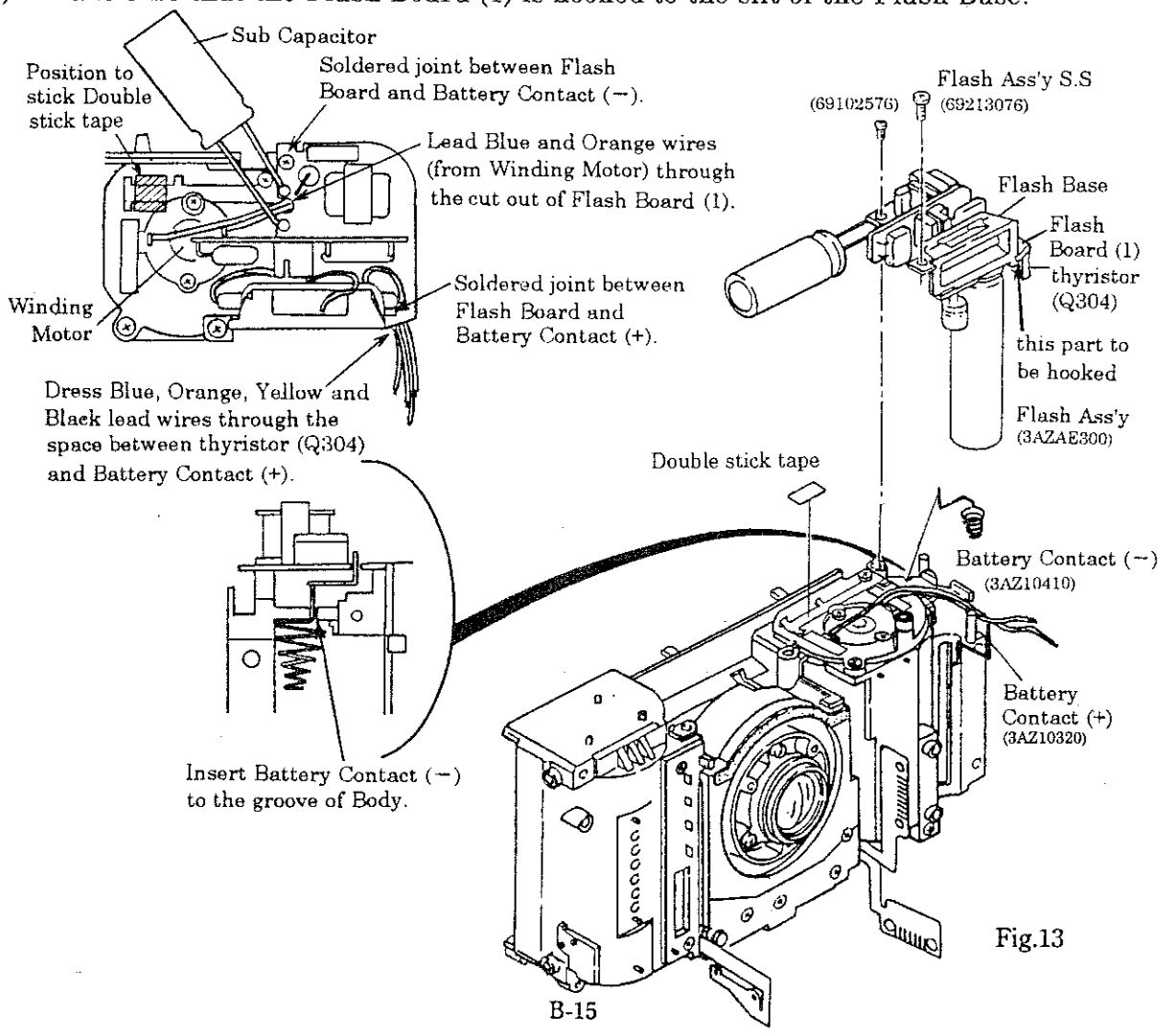

Sub Capacitor
Position to stick Double stick tape
Soldered joint between Flash Board and Battery Contact (−).
Lead Blue and Orange wires (from Winding Motor) through the cut out of Flash Board (1).
Winding Motor
Soldered joint between Flash Board and Battery Contact (+).
Dress Blue, Orange, Yellow and Black lead wires through the space between thyristor (Q304) and Battery Contact (+).
Flash Ass'y S.S
(69102576)
(69213076)
Flash Base
Flash Board (1)
thyristor (Q304)
this part to be hooked
Flash Ass'y (3AZAE300)
Double stick tape
Battery Contact (−) (3AZ10410)
Battery Contact (+) (3AZ10320)
Insert Battery Contact (−) to the groove of Body.

Fig.13

B-4 Disassembly of Winding/Rewinding Mechanism

B-4-1. Disassembly of Winding/Rewinding Mechanism (See Fig.14)

1) Remove the MM Base Plate Setscrews (69313576) x 4 and then the MM Base Plate (3CP60500).
2) Remove the Rewind Spring (3CP60600), Rewind Fork (38462220) and Rewind Gear (38462110).
3) Remove the MM Gear (2) (3AZ61000), MM Gear (3) (3AZ61100) and MM Gear (1) (3AZ60900) x 2.
4) Remove the Epicyclic Lever Ass'y (3CPB1100).

Notes:

a) Adjustment of the Epicyclic Lever Ass'y torque is done in the factory. Since the adjustment can not be done in a service area, never rotate the screw on the Epicyclic Lever Ass'y.
b) When reassembling the MM Base Plate, engage the protrusion of the Epicyclic Lever Ass'y to the fan-shaped hole of the MM Base Plate.

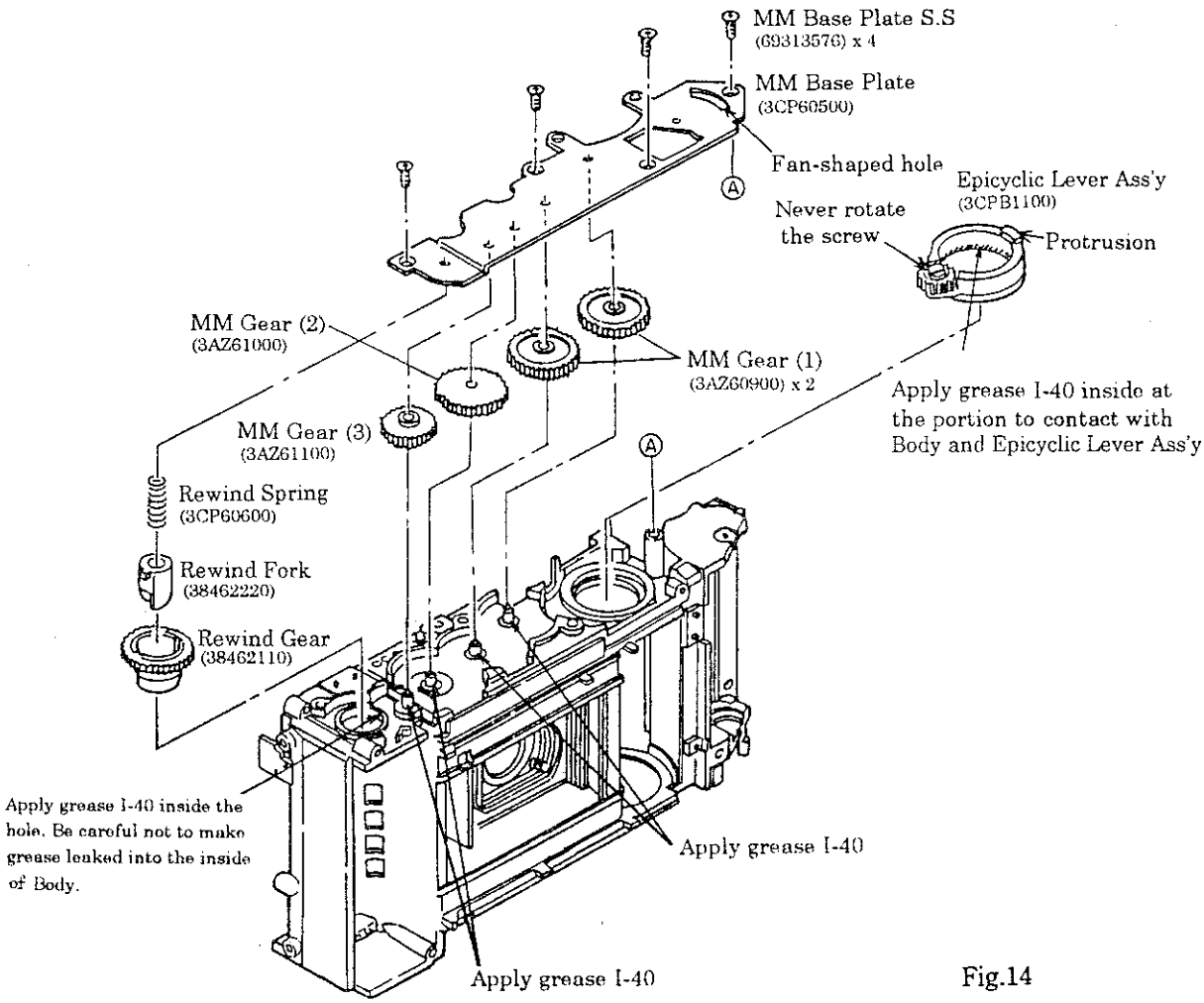


Fig.14

B-4-2. Removal of Winding Unit (See Fig.15)

1) Remove the Winding Unit Setscrews (69113576) x 2, and then remove the Winding Unit (3AZ60100).

Notes:

a) A glue (Three Bond 1521B) is applied in the space between the Winding Unit and the Body. Take care when removing the Winding Unit. When reassemble the Winding Unit, apply the Three Bond 1521B.

b) Parts of the Winding Unit are not supplied separately. When any parts requires replacement, replace with Winding Unit (3AZ60100) with a new one.

[Note on Assembling Winding Unit]

When assemble the Winding Unit (3AZ60100), take care the AL Roller not to locate behind the spool.

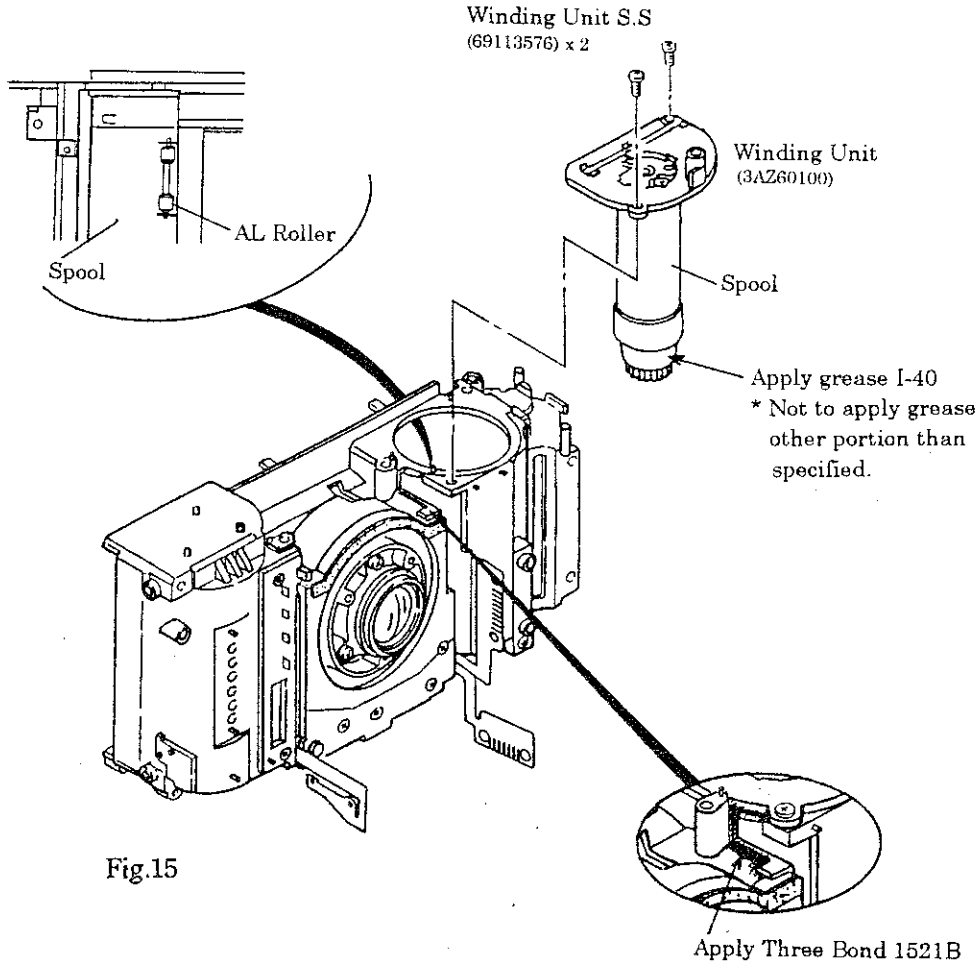


Fig.15

B-5 Removal of Collapsible Mount Ass'y

B-5-1. Removal of Collapsible Mount Ass'y (See Fig.16)

1) Remove the Collapsible Ass'y Setscrews (69112576) and (69113576) x 4, and then remove the Collapsible Mount Ass'y (3CPB1200) from the Body.

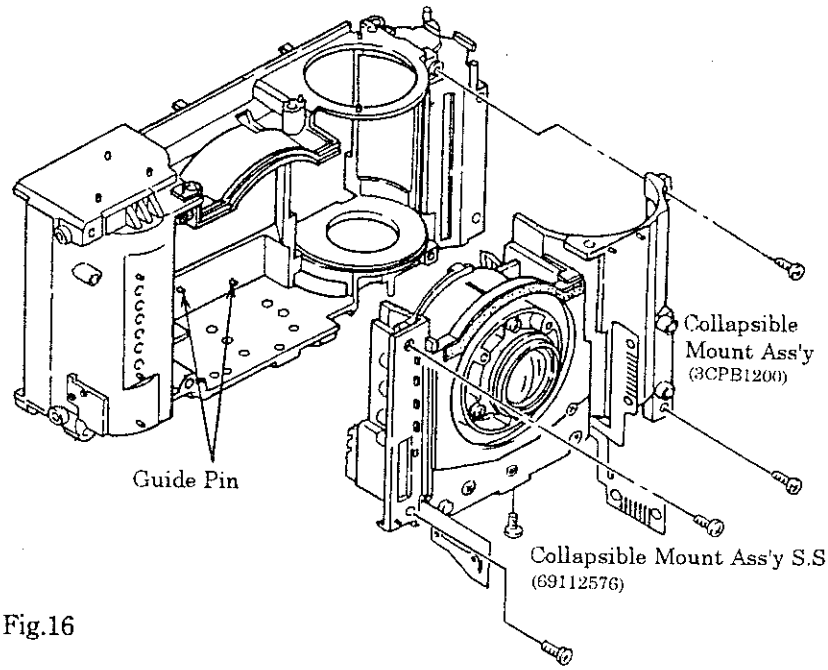


Fig.16

[Notes on Reassembly of Collapsible Mount Ass'y]

a) Install the Collapsible Mount Ass'y in the Body after making sure that the gap between the Motor Holder and the Shutter is in parallel.

b) When installing the Collapsible Mount Ass'y, fit the two holes (See Fig.17) in the Motor Holder to the two pins (See Fig.16) of the Body.
Tighten the Collapsible Mount Ass'y Setscrews (69113576) x 4 and (69112576) after making sure that there is no gap between the Body and the Collapsible Mount Ass'y.

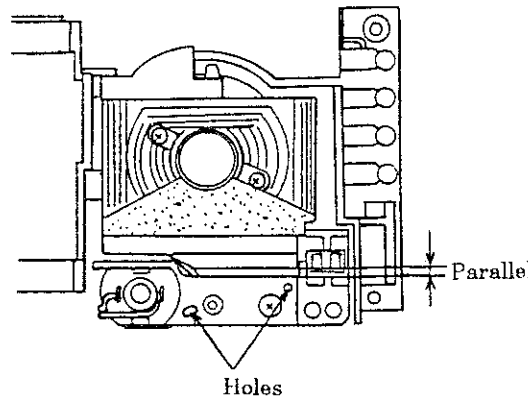


Fig.17

B-5-2. Disassembly of Collapsible Mount Ass'y (See Fig.18)

1) Remove the AF Front Plate Setscrews (69115576) x 2.
2) Remove the Guide Shaft Setscrew (66001029) ①.
3) Remove the AF Motor Holder Ass'y (3CPB1300), and then remove the Barrier Lock Spring (3AZ23600) and Barrier Lock Shaft (3AZ23500).
4) Remove the AF Gear (1) (3AZ20300).
5) Remove the Guide Shaft Setscrew (66001029) ② and remove the AF Front Plate (3CP20100) from the Lens Barrel Unit.

Note:
The Shutter FPC is fixed to the AF Front Plate with a Double stick tape.
When removing the AF Front Plate from the Lens Barrel Unit, take care not to break the patterns of Shutter FPC.

6) Remove the Screw Gear (3AZ20410).
7) Remove the Guide Shaft (3AZ20610).
8) Remove the Lead Screw (3AZ20510) by turning it in the direction of the arrow (counterclockwise).
9) Remove the Lead Screw Nut (3AZ20920).

[Note on Handling of Lens Motor]

The AF Motor Pinion should be installed at the specified direction so that requires a special tool for alignment. Therefore, the parts on the Lens Motor will not be supplied separately. When any parts requires replacement, replace with AF Motor Holder Ass'y (3CPB1300) with a new one.

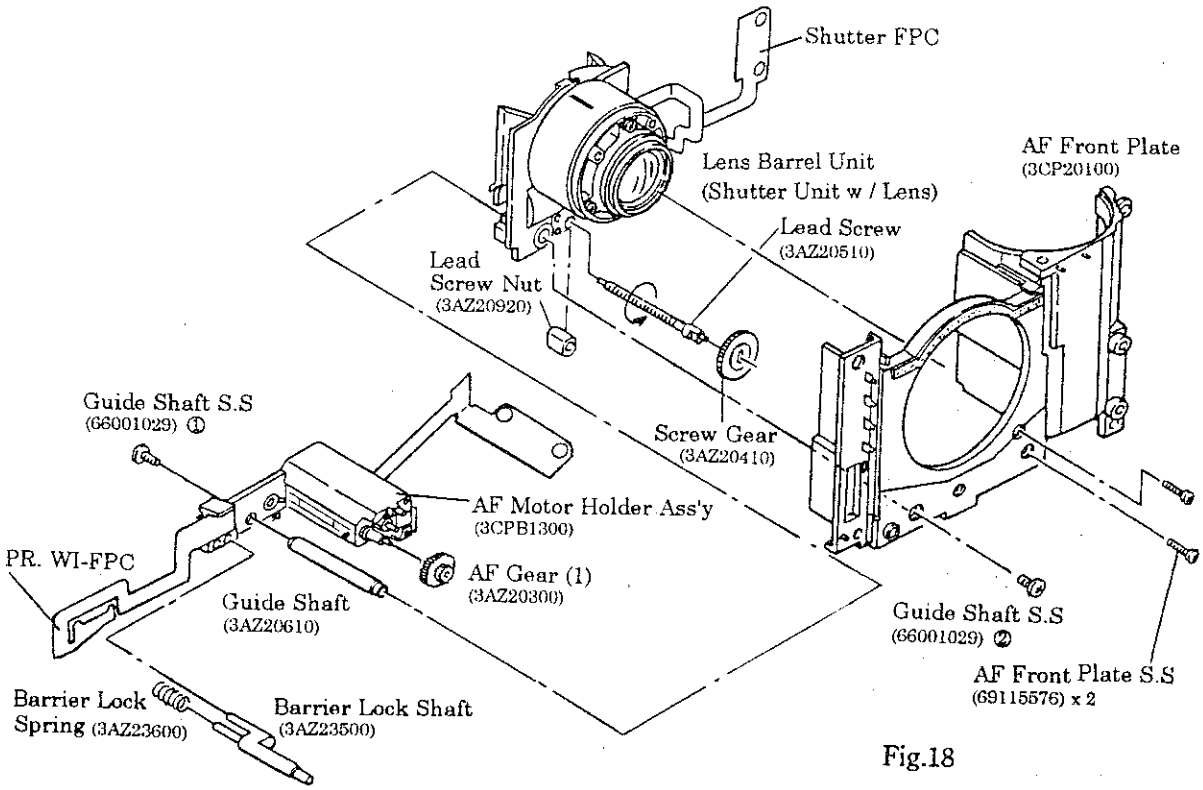


Fig.18

[Reassembly of AF Front Plate]

1) Apply grease BG-15 to the both end of AL Roller (3BK16600) and set it in the AL Roller Holder (3BK16500).

Notes:

a) Not apply grease other than the both end of AL Roller.

b) Make sure that the AL Roller has to be held at the AL Roller Holder by at least a half length of its one end even when pushed to the other side.

2) Install the AL Roller Holder & AL Roller to the AF Front Plate (3CP20100) and fix the AF Roller Holder with a glue (Three Bond 1521B) at two points.

3) Insert the DX-SW (3AZ12100) in the AF Front Plate engaging the claw of the DX-SW properly with the hole in the AF Front Plate.

4) Fix the specified two sides of the DX-SW with a bond (Cemedine 551).

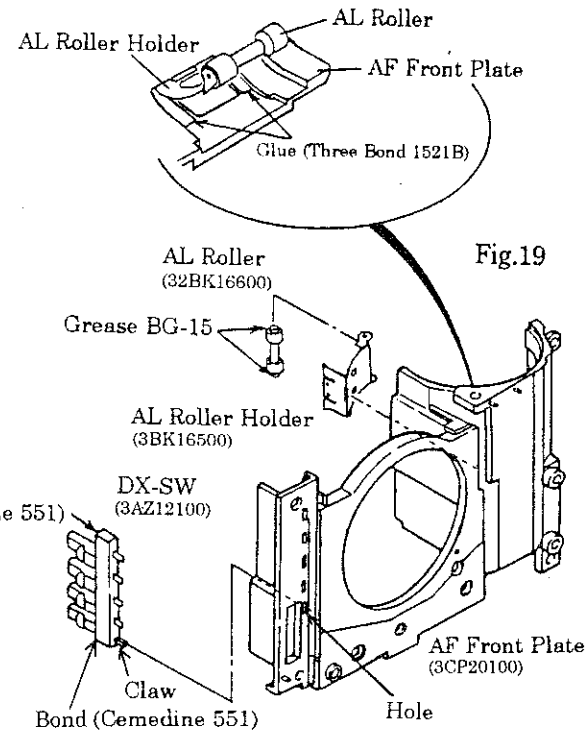


Fig.19

[Reassembly of AF Motor Holder]

1) Attach the Lens Barrel FPC Tape (3AZ21500) on the AF Motor Holder in parallel to its protrusion by fitting it to the pin of the AF Motor Holder.

2) Install the cut portion of the Photo-interrupter (5ENCSG105F***01) in the AF Motor Holder in a position as shown in Fig.21.

3) Engage the holes of the PR WI-FPC (3CP50900) with the terminals of the Photo-interrupter and solder them.

4) Cut the legs of the Photo-interrupter. The height of terminals of Photo-interrupter is within 1.2 mm Max.

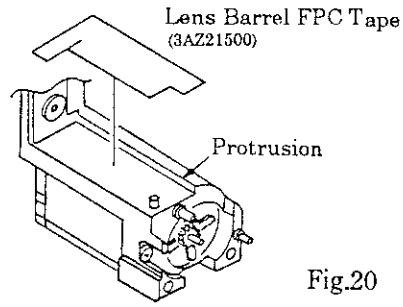


Fig.20

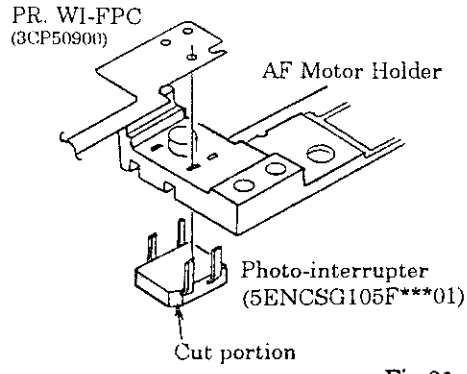


Fig.21

Note :

a) The Photo-Interrupter, Af Motor Holder and PR. WI-FPC should be aligned in parallel.

b) Check the condition of soldering after cutting the terminals of Photo-interrupter.

[Reassembly of Lens Barrel]

1) Install the Taking Lens Unit (3CP22000) on the Shutter (3CP21000) and tighten it with the Taking Lens Unit Setscrews (69113576) x 3.
2) Attach the Shutter Light-Proof Paper (3AZ22500) on the Shutter with (c) as the reference.
3) Attach the Barrel Light-Proof Paper (3AZ22720) on the Shutter with (a) and (b) as the reference.

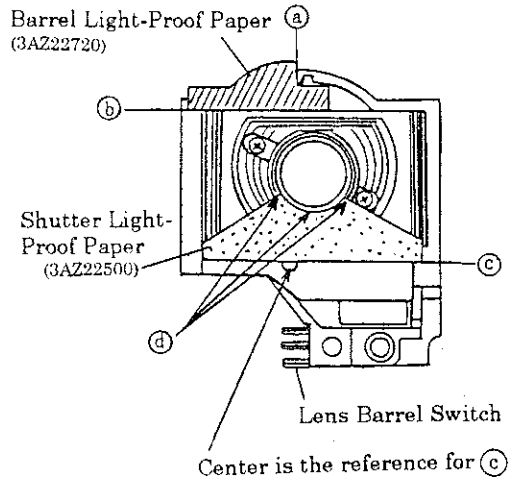


Fig.22

Note:

a) Take care the portion (d) of the Shutter Light-Proof Paper will not intercept light beam.

b) Attach the Barrel Light-Proof Paper and the Shutter Light-Proof Paper firmly by pressing with your finger to prevent peeling off.

c) Take care not to deform or smear the Lens Barrel Switch contacts.

[Regarding Washer applied between Lens Unit and Shutter]

* At the initial production stage, there were two washers inserted between the Lens Unit and the Shutter temporarily.

Part Name : Washer
Part Number : 60111810 (t=0.1)
60651810 (t=0.05)

The new Shutter has been modified with additional material on the Shutter.

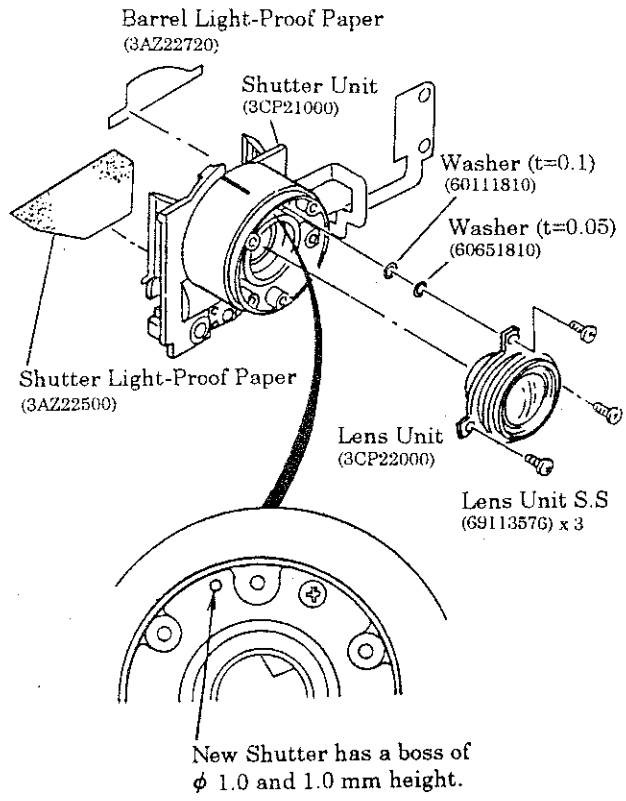


Fig.23

(Note on Repair)

a) The Washers are not fixed by a glue. Take care not to lose the Washers when removing the Lens Unit.
When reassembly the old Shutter, the Washers should be installed. Otherwise, one side of image would be vague.
b) Don't use the washers for the new Shutter.

[Reassembly of Collapsible Mount Ass'y]

1) Attach Double stick tape (9 x 12 mm) on the top of Lens Motor. (See Fig.25)
2) Install the Photo-Interrupter of AF CD-FPC (3CP50800) by fitting its pin in the hole of the AF Motor Holder Ass'y. (See Fig.24) Be careful not deform the AF Motor Pinion.
3) Peel off the back paper of the Lens Barrel FPC (3AZ21500) (See Fig.21) and attach the AF CD-FPC in parallel to the AF Motor Holder. In doing so, press the pattern surface of the AF CD-FPC lightly with a lens cleaning paper. (See Fig.25)
4) Peel off the back paper of the Double stick tape described in the step 1) above and attach the AF CD-FPC on it.
5) Assemble the AF Gear (1) (3AZ20300).
6) Install the Lead Screw Nut (3AZ20510) on the Shutter Unit (3CP2100). (See Fig.26)
7) Apply grease H-26 evenly to the Lead Screw (3AZ20510) while turning it.

(Definition of New and Old Shutter)

* There is a boss of 1.0 mm diameter and 1.0 mm height inside of the new Shutter.

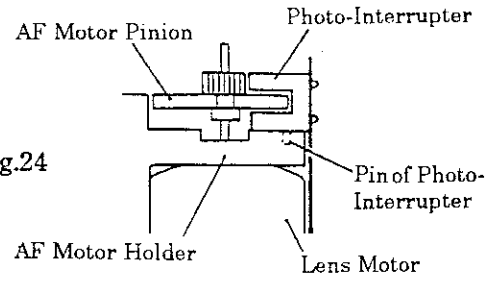


Fig.24

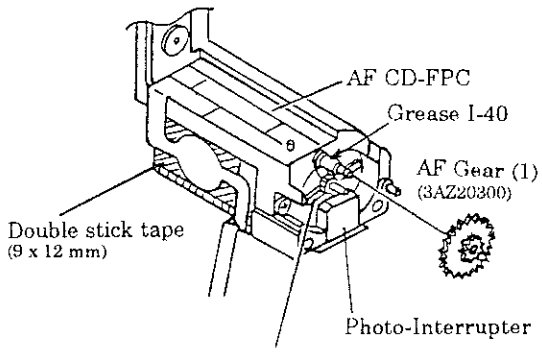


Fig.25

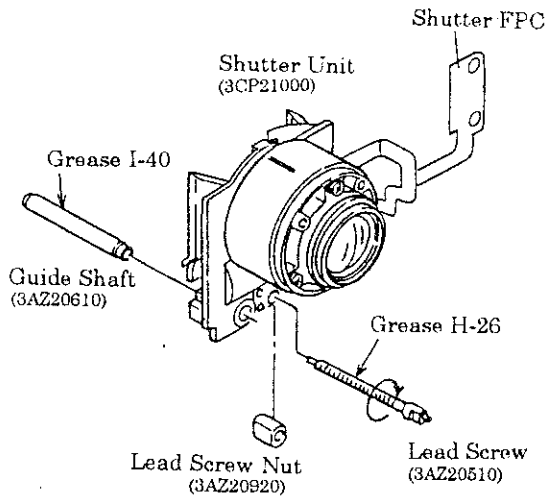


Fig.26

8) Turn the Lead Screw in the direction of the arrow (clockwise) until it is half inserted.
9) Apply a thin film of grease I-40 to the whole surface of the Guide Shaft (3AZ20610) and insert the Shaft. Make sure the smooth movement of the Guide Shaft.
10) Attach double stick tape (9 x 16 mm) on the inside of the AF Front Plate along the corner. (See Fig.27)
11) Attach the Shutter FPC on the Double stick tape. (in the position as shown in broken lines in Fig.27)

Note:
After attaching the Shutter FPC, take care not to break the printed circuit pattern since the FPC is fixed.

12) Apply grease H-26 to the inside of the Lead Screw Hole from the inside of the AF Front Plate. (See Fig.28)
13) Install the Lead Screw Gear (3AZ20400) at the end of the Lead Screw.

Note:
When installing the Lead Screw Gear, take care not to confuse the head and tail of the gear. (See Fig.28)

14) Install the Shutter Unit (3CP21000) and the AF Front Plate to each other.
15) Make sure that the Guide Shaft and the AF Front Plate are in close contact with each other. Then temporary tighten the Guide Shaft Setscrew (66001029) ①.
16) Apply grease G-347CA (conductive grease) to the end of the Lens Barrel switch on the Shutter.

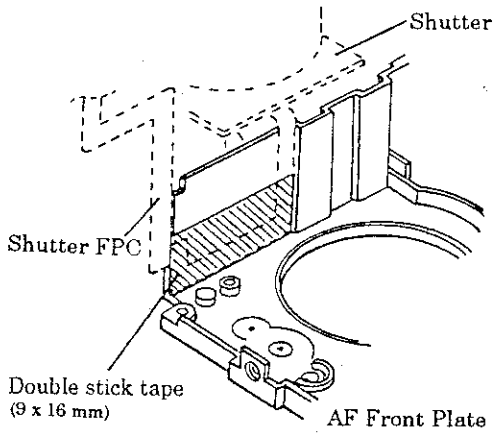


Fig.27

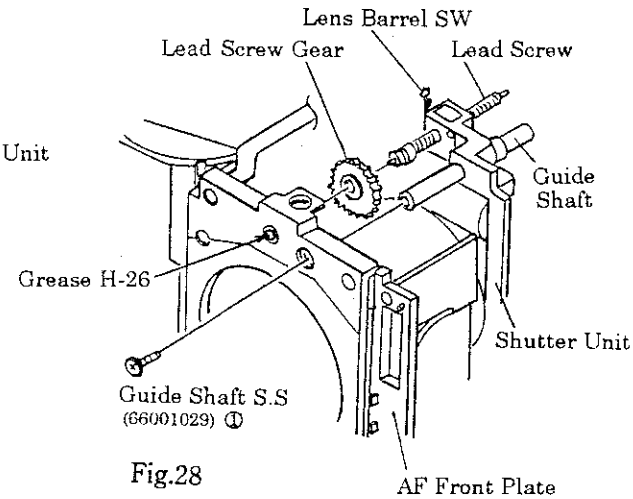


Fig.28

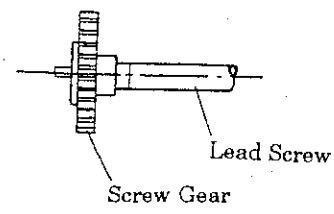


Fig.29

Note:

Take care not to deform the Lens Barrel Switch contact when applying the grease.

17) Apply grease H-26 to the three specified areas on the Barrier Lock Shaft (3AZ23500), and then install the Barrier Lock Spring (3AZ23600) in it. (See Fig.30)
18) Wipe the pattern on the AF CD-FPC with ether alcohol.
19) Apply grease H-26 to the inside of the Lead Screw Hole in the AF Motor Holder.
20) Install the AF Motor Holder while bending the PR. WI-FPC lightly and dressing it on the front side through the groove in the AF Front Plate. In doing so, fit the Barrier Lock Shaft, Lead Screw and Guide Shaft in the holes in the AF Motor Holder.
21) Make sure that the AF Front Plate and the AF Motor Holder are in close contact with each other. (Temporary tighten the Guide Shaft Setscrews (66001029) ②. Tighten firmly the Guide Shaft Setscrew (66001029) ① described in the step 15) above. Tighten the Guide Shaft Setscrew (66601029) ② again firmly.
22) Tighten the AF Front Plate Setscrews (69115576) x 2.

Notes:

a) When installing the AF Motor Holder to the AF Front Plate, take care not to deform the Lens Barrel Switch contacts.
b) Make sure that the Barrier Lock Shaft moves smoothly.

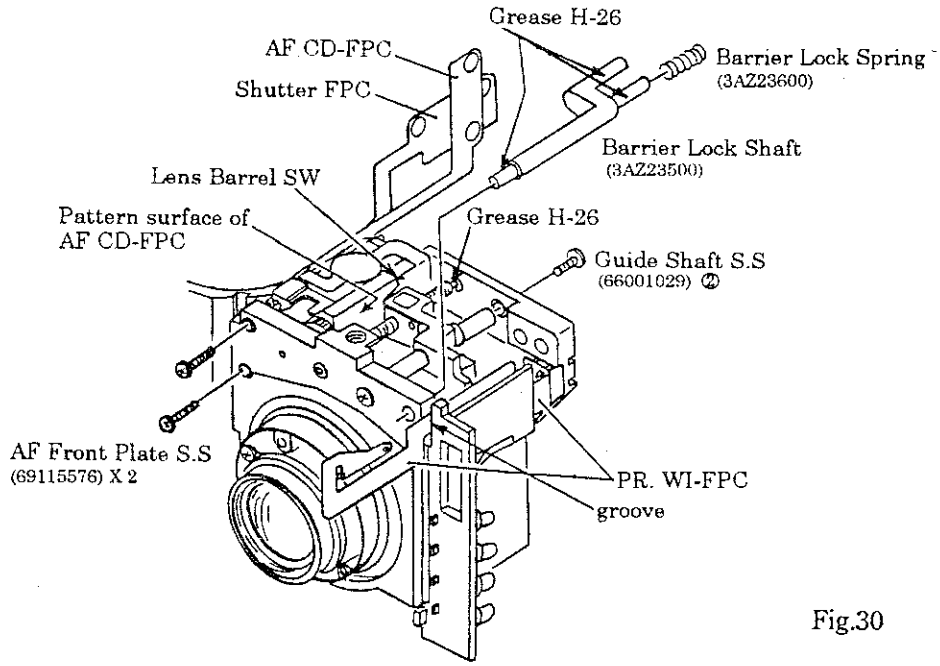


Fig.30

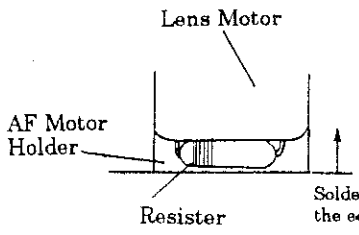
23) Solder a resister (5ERDA2E15002*13) in between the terminals of the Lens Motor.

Note:

Make sure that the yellow and brown lead wires and the solder for the resister should not come out from the AF Motor Holder.

24) Fix the brown and yellow lead wires with Double stick tape.
25) Bend the Shutter FPC lightly in the direction of the arrow.

26) Bend the AF CD-FPC lightly in the direction of the arrow.



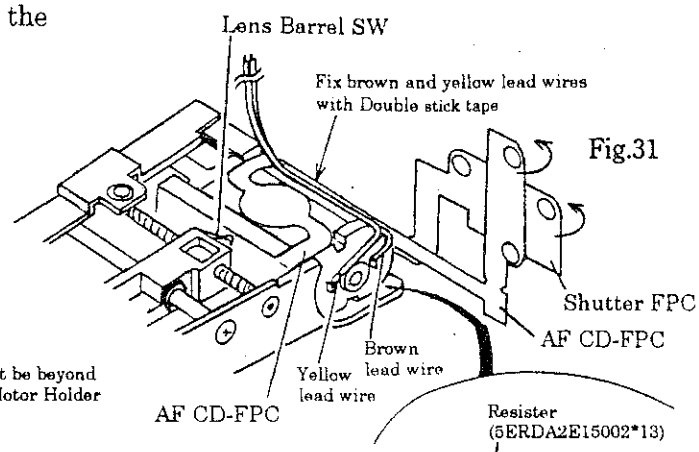


Fig.31

[Confirmation of Collapsible Mount Ass'y Retraction]

1) Set the Regulated D.C Power Supply 2.0 V.
2) Connect the positive terminal of the Regulated D.C Power Supply to the brown lead wire of the Lens Motor. Connect the negative terminal to the yellow lead wire of the Lens Motor.
3) Check if the Taking Lens extends.
4) Connect the positive terminal of the Regulated D.C Power Supply to the yellow lead wire of the Lens Motor. Connect the negative terminal to the brown lead wire of the Lens Motor.
5) Check if the Taking Lens retracts.
   * The Lens must move forward and backward within 500 mA all over the moving.
   * Make sure that there is no lens moving noise or unstable lens moving.
   * Make sure that the Lens Barrel Switch slides along the pattern on the AF CD-FPC.

[Positioning of Light-Shield Barrel Moquette]

After installing the Lens Barrel Ass'y on the Body, attach the Light-Shield Barrel Moquette (3CP21700) x3 at three positions shown in Fig.32.

Notes:

a) Never forget to attach the Light-Shield Barrel Moquette. Otherwise, it causes the flange back failure.
b) Place the Light-Shield Barrel Moquette at the three positions equal to the circumference of Lens Barrel.
c) The Light-Shield Barrel Moquette should be laced as close to the Shutter Barrel as possible. However, don't allow its sticky surface touch with the Shutter Barrel.

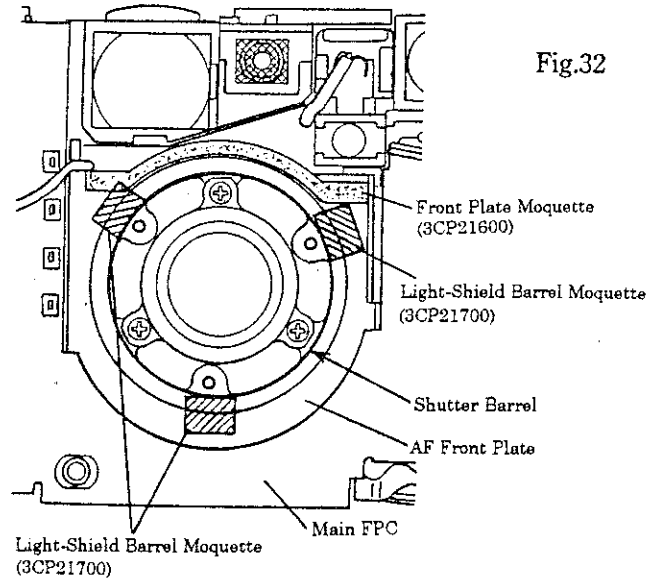


Fig.32

B-6 Dressing of Lead Wires

B-6-1. Dressing of Lead Wires

* Dress the lead wires as shown in Fig.33.

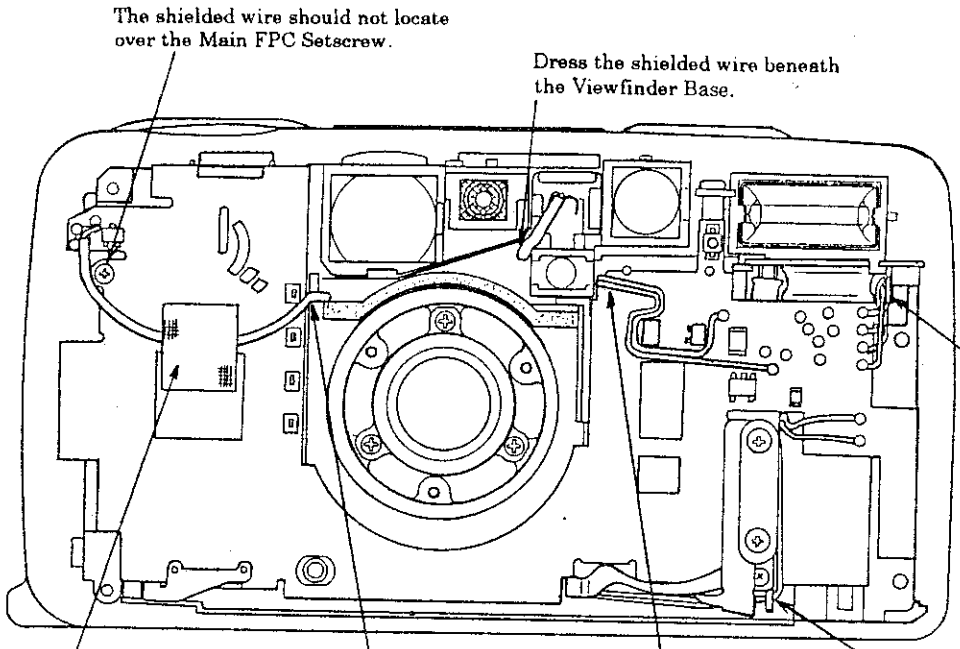

The shielded wire should not locate over the Main FPC Setscrew.
Dress the shielded wire beneath the Viewfinder Base.
Pull the blue, orange, red and black lead wires out from the space here, and never locate them around the hole of Body.
Fix the shielded wire with Acetate Cloth tape.
Dress the brown and yellow lead wires (of the Lens Motor) behind the pin and route them in the space between the Body and the Main Capacitor.
Dress the shielded wire in the groove of AF Front Plate. Don't allow the shielded wire locate over the soldered joints of DX-SW.
Pull the white and yellow lead wires from here and dress them not routing over the electric components.

Fig.33

B-7 Disassembly of Back Cover (D) Ass'y

B-7-1. Disassembly of Back Cover (D) Ass'y

Note :

Since this product has the weather proof constitution, shielding is applied for Eye-piece Window, Cartridge Window, Date Window, Date Buttons, and Back Cover Packing, it is not allowed to remove them from the Back Cover Ass'y. Therefore, any parts other than described in Fig.33 will not be supplied.

1) Remove the Pressure Plate (3BR35200).
2) Remove the Film Guide Setscrews (62902026) x 2 and the Film Guide (3CP12700).
3) Remove the Back Cover Base Plate Ass'y Setscrews (69313076) x 4 and the Back Cover Base Plate Ass'y (3CPB3400).
4) Remove the Date Spring Setscrew (66001154) and the Date Spring (3CP15310).
5) Remove the Auto Date Module (3CK56100) with the Date FPC Ass'y (3CPE1300).

[Confirmation of Back Cover (D) Ass'y after reassembly]

* After reassembled the Back Cover (D) Ass'y, make sure that the Date FPC is return to its original position when pulling it lightly and releasing.

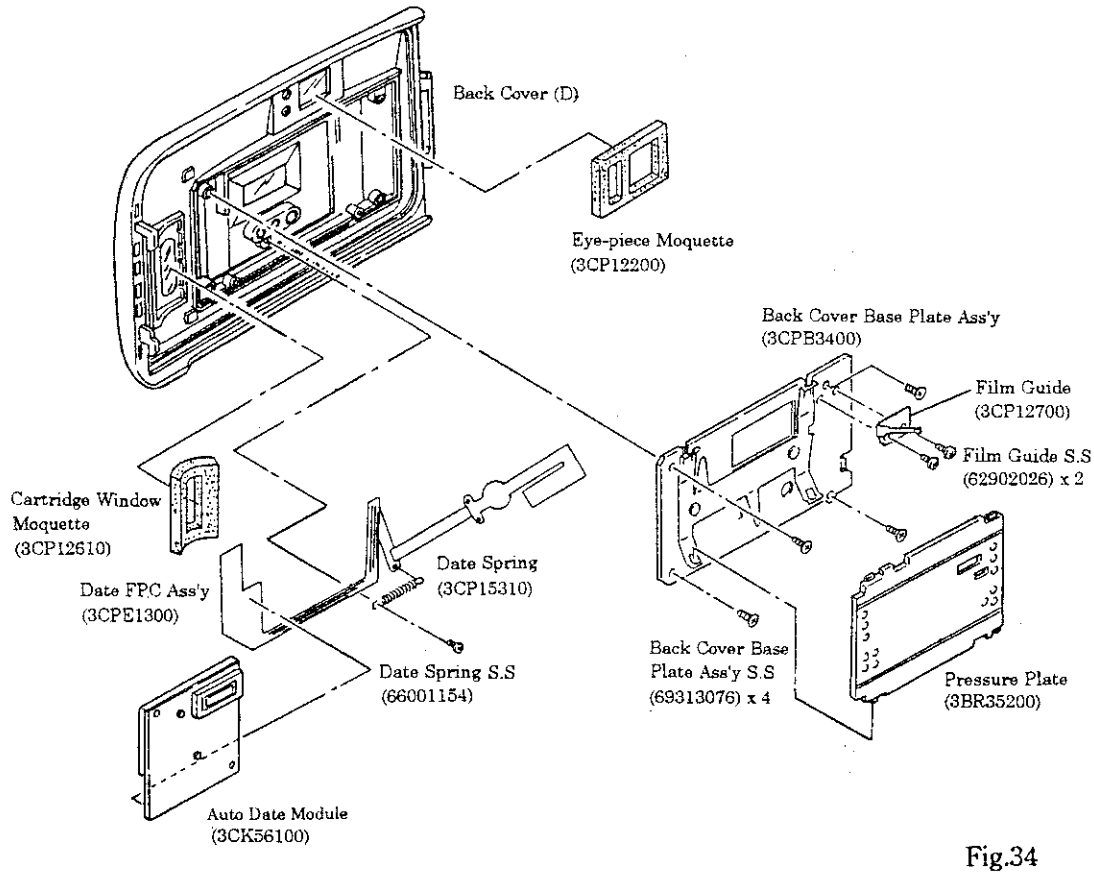


Fig.34

[Soldering of Date FPC Ass'y]

1) When the Auto Date Module is replaced with a new one, make sure to short the pattern by soldering as shown in Fig.35.
2) Solder the Date FPC Ass'y to the Auto Date Module (3CK56100).

* Set the Date FPC Ass'y in parallel to the Date Module. Never install the portion Ⓐ shown with arrow in the direction of expansion.

3) Bend the Date FPC as shown in Fig.35.

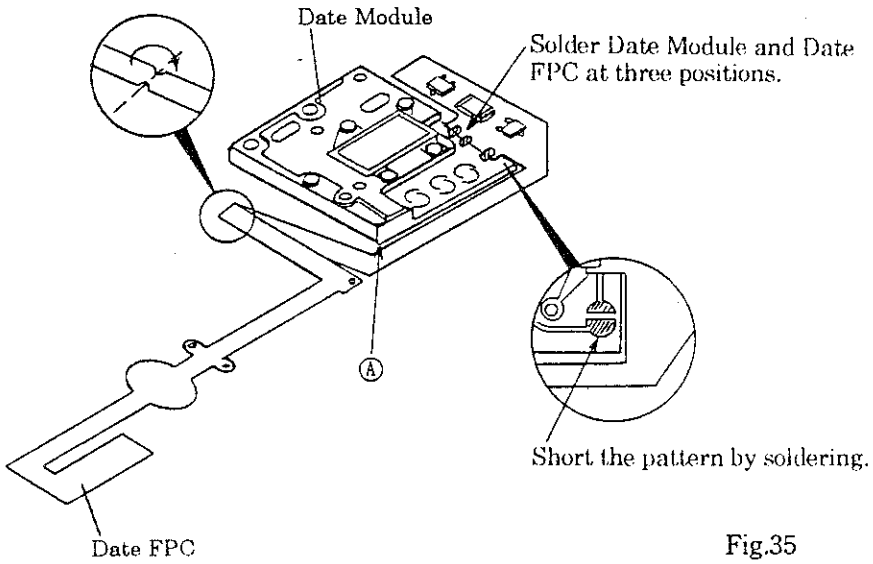


Fig.35

■ Parts Modification List

[1] Addition of Back Cover Light-Shield Tape on Back Cover (D) Ass'y and Back Cover (N) Ass'y.

Because of an anxiety to have a light leakage on the Sliver finish types, a Light-Shield Tape is added on the Back Cover (D) Ass'y (KYOCERA T PROOF Silver finish, YOSHICA T5 (D) Silver finish) and the Back Cover (N) Ass'y (YASHICA T5 Silver finish).

(Back Cover (D) Ass'y)

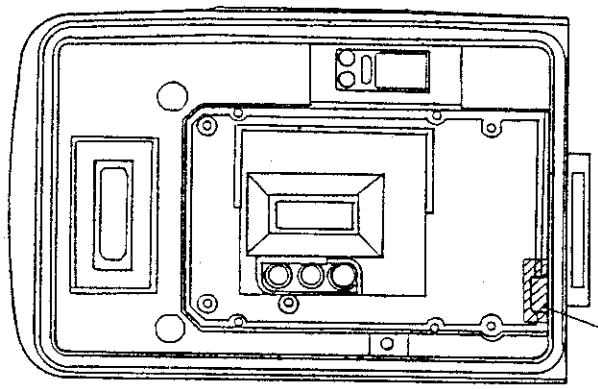


Fig.36

* Make sure to have no gap between the rib of Back Cover Ass'y.

(Back Cover (N) Ass'y)

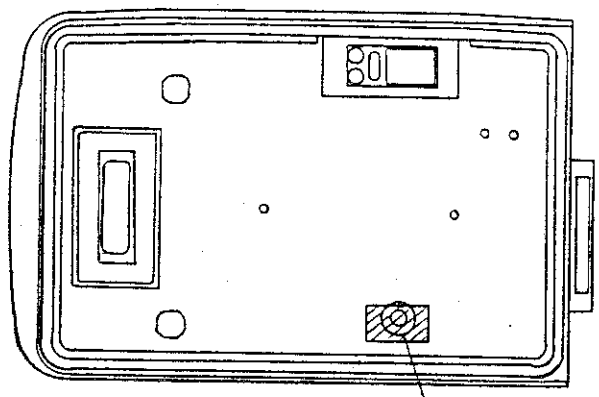


Fig.37

* Make sure to hide the lower part of the gate with the tape.

[2] Addition of Shutter Light-Shield Paper

The Shutter Light-Shield Paper (3CP16200) is added on the side of Shutter Frame to prevent the light leakage from the upper right of inside of the aperture.

Note:

a) Attach the Shutter Light-Shield Paper (3CP16200) aligning to the side lines Ⓐ and Ⓑ of the Shutter Frame.

b) Give sufficient pressure on the Shutter Light-Shield Paper to make sure not being peeled off.

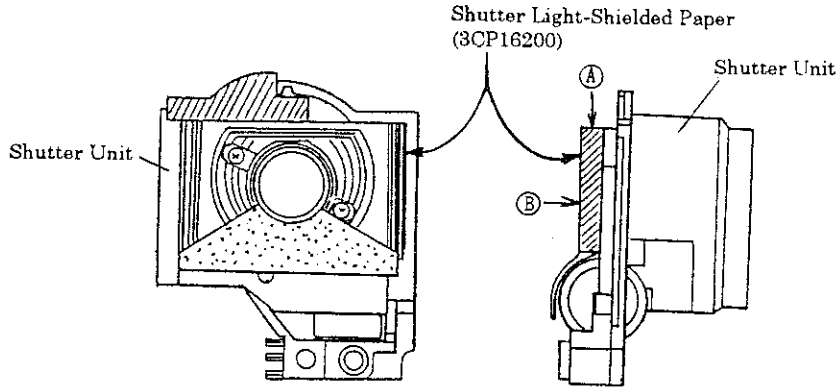
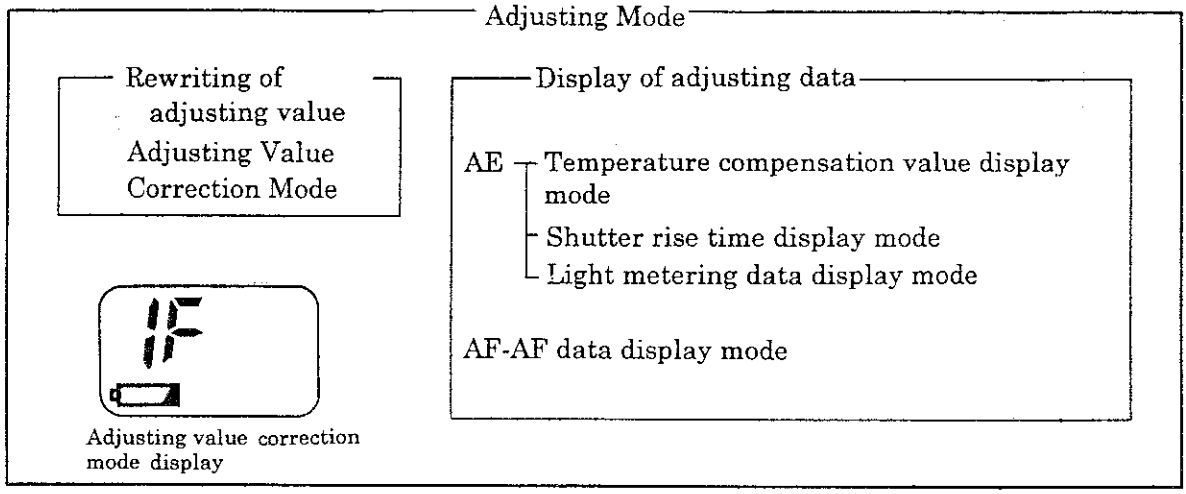


Fig.38

C. ADJUSTMENT PROCEDURE AND OTHERS

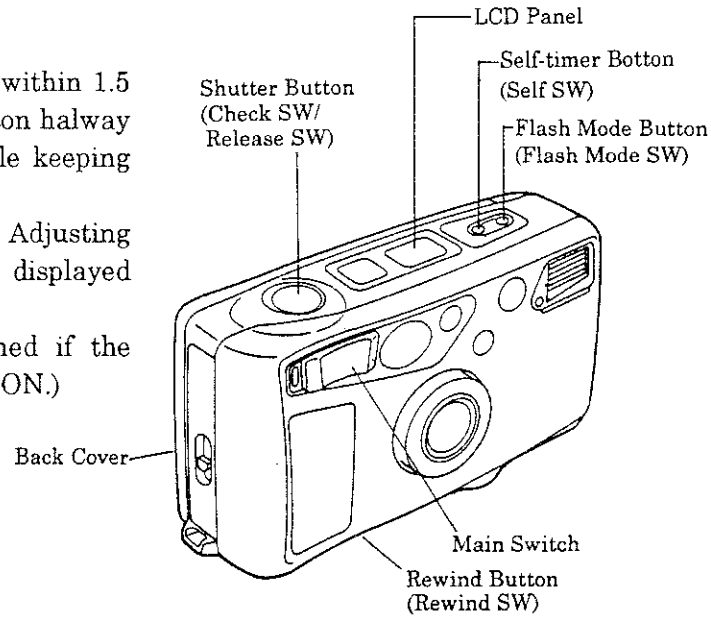
C-1 Adjustments of Compensation Values

*This camera permits the adjustments of compensation values (adjusting values) by its own manual operation. Therefore, such adjustments can be made on the camera and measuring instruments without communicating with any special adjustment apparatus.
In adjustment, each adjusting value can be displayed on the LCD or the display of the backup data written on EEPROM can be changed.

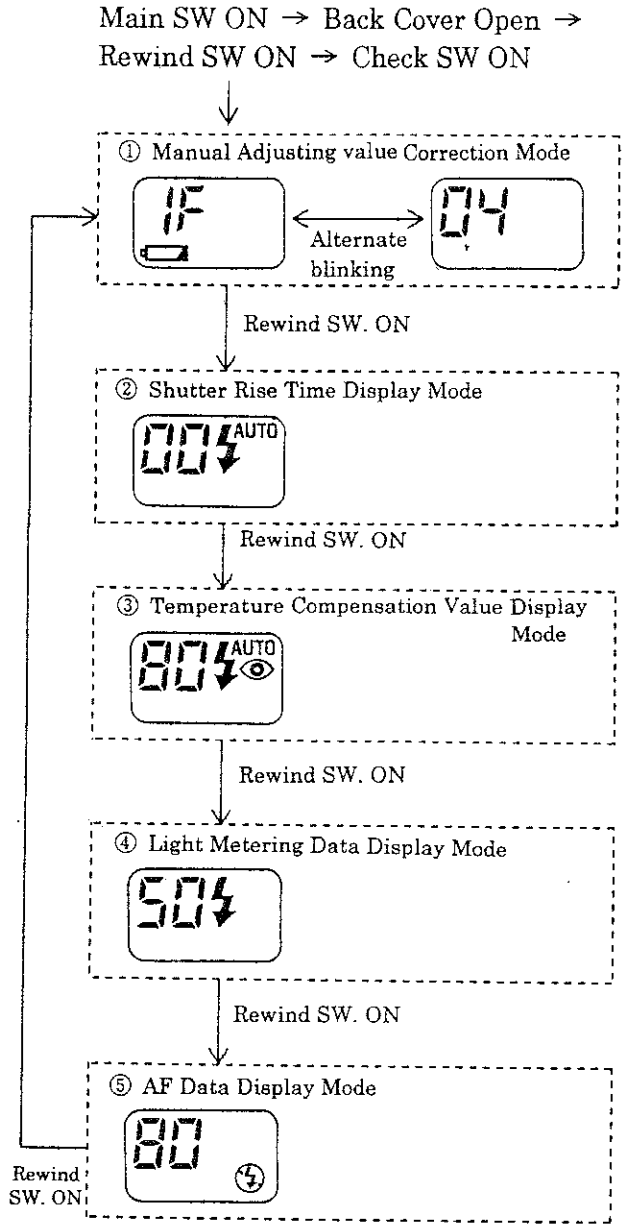


C-1-1 Setting of Adjusting Mode Follow the following procedure:

① Turn ON the Main Switch.
② Open the Back Cover.
③ Press the Rewind Switch and within 1.5 seconds press the Shutter Button halway down (Check Switch ON) while keeping the Rewind Switch pressed.
1.5 seconds or more later, Adjusting Value Correction Mode will be displayed on the LCD.
(Mode setting is not performed if the Shutter Release is also turned ON.)



C-1-2 Kinds of Adjustments and Transition Procedure



Display backup data and its address read on RAM and written on EEPROM and change the data on RAM. (Writing on EEPROM is performed at completion of adjustment.)

The AF lens drive position is such that the shutter opens fully at infinity. The LCD displays the time from pinhole timing to "full-open" timing.

The LCD displays the A-D converted value of the resistance-divided voltage from the thermistor every 500 msec.

Light metering is performed every 500 msec. and the light metering values are displayed on the LCD in the form of EV code.
The LCD displays three kinds of data average low brightness / high brightness and spot high brightness.

Distance metering is performed every 500 msec. and the number of pulses calculated by the AF-IC is displayed on the LCD.
The LCD displays three kinds of data center, right and left distance metering.

C-1-3 Completion of Adjusting Mode (Writing into EEPROM)

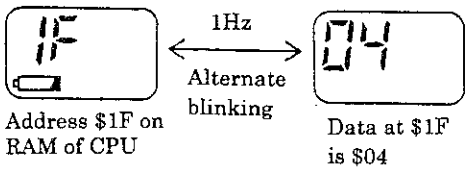
In any mode, turning off the Main Switch will complete the current operation.
Then all the backup data on RAM are written on EEPROM.
The LCD display returns to " 0 " display.
Writing of adjusting values is performed only by turning OFF the Main Switch.

C-1-4 Description of Operation in Adjusting Mode

No normal camera operations are performed in any adjusting mode.
Therefore, no unnecessary switch detections are performed. At the occurrence of an error in adjusting mode, the error code is written on EEPROM the same way as in normal operation and the adjusting mode is completed.

1. Adjusting Value Correction Mode

① At transition to the adjusting mode, this adjusting value correction mode is set first.
② When this mode is set, the data storage address (RAM) and the data blink alternately at 1 Hz on the LCD.



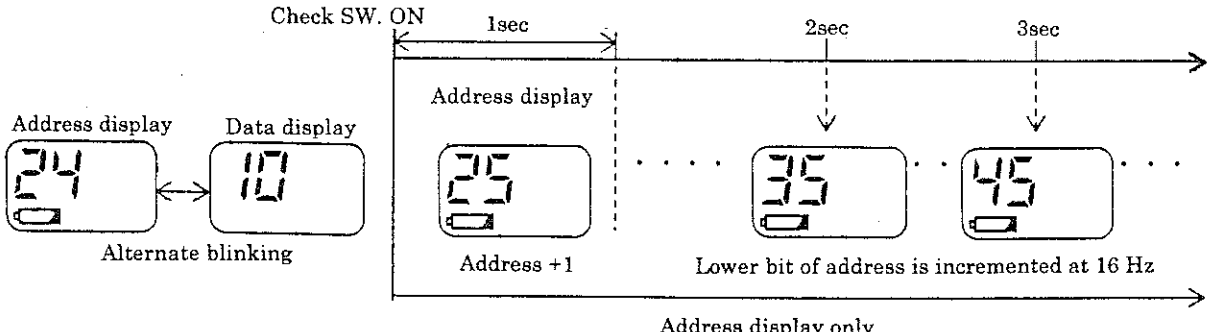
The counter value on the " ▭ " mark side indicates the backup data storage address on RAM.

The addresses displayed are $1F to $57. The display start address is $ 1F.
After the final address $57, the display returns to $1F.

③ Change of address and data

Address change :

The address display is automatically incremented while the Check Switch is turned ON.
The address is changed by +1 within 1 sec after turning ON the Check Switch.
When the Check Switch is kept ON for more than 1 sec, the lower bit is incremented at 16Hz.
Address only is displayed as long as the Check Switch is turned ON.
With the Check Switch turned OFF, the address currently displayed and its data blink alternately at 1 Hz.
Example : When Check Switch is turned ON at address $24 display



Data change :

Data can be changed by turning ON the Self-timer Switch or Flash Mode Switch.
Data only is displayed as long as the Self-timer Switch or Flash Mode is turned ON. With both switches turned OFF, the address and data blink.
The data change range is $00 to $FF, $FF is followed by $00.

a) Data increment

The data display is automatically incremented while the Self-timer Switch is turned ON.

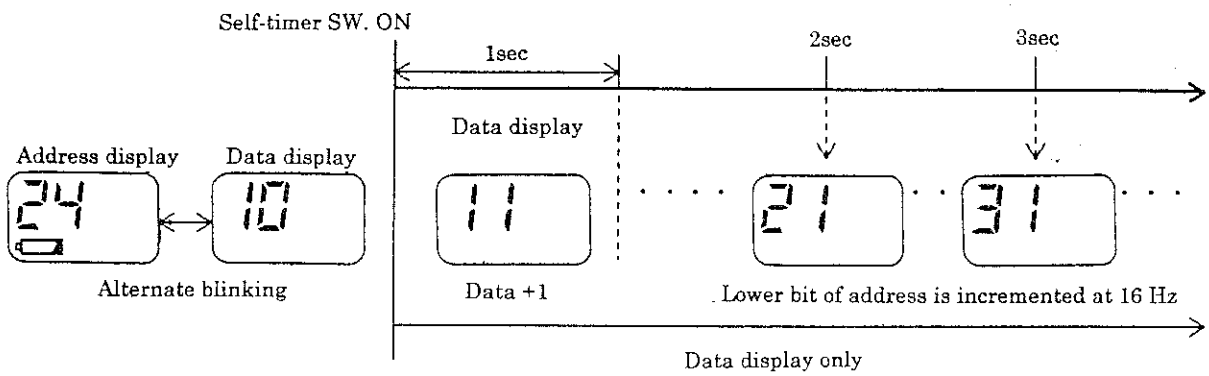
Increment is performed the same way as that at address change.

b) Data decrement

The data display is automatically decremented while the Flash Mode Switch is turned ON.

The timing of decrement is the same as that of increment.

Increment of data $10 at address $24 (on CPU)

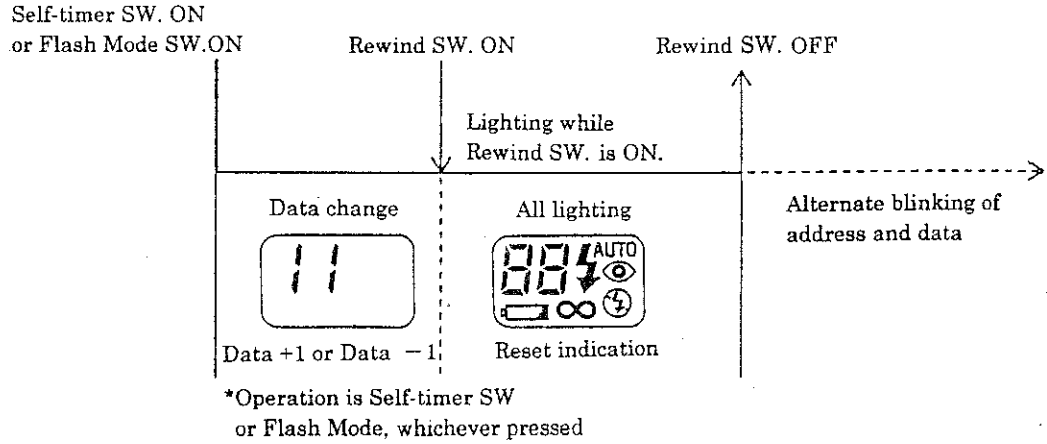


④ Reset of all backup data (Writing of initial adjusting value)

During data change by press of the Self-timer Switch or Flash Mode Switch, perform the writing of the initial adjusting value by turning ON the Rewind Switch.

a) Set the data address (address $1F) in the backup data area to $04, the film counter (address $20) to $00 and the status information (address $21) to $0F.

b) Clear all of the battery level (address $24) in the adjusting value area through the AF set drive start remaining pulse (address $4B) to $00.



⑤During address change or data change in this mode, no other switch detections are performed.

⑥Transition to the next mode by turning ON the Rewind Switch and completion of adjusting mode can be performed only during alternate blinking of address and data, not during address or data change.

2. Shutter Rise Time Display Mode

①This mode is set by turning ON the Rewind Switch in the adjusting value correction mode.

②At the beginning of this mode, the LCD display is as follows :

Lighting

③Operate the shutter by turning ON the Release Switch and measure the time from the pinhole timing to the "full open" timing.

- Shutter time is 1/60 to the turning OFF of the Release Switch.
- Like in the normal camera operation, the shutter operates in the sequence of AF set drive → Shutter operation → AF reset drive.
  The AF set drive position in this case is infinity (backup data).
- After completion of shutter operation, AF reset drive is performed.

④After completion of AF reset drive, the measured time is displayed on the LCD.
The time displayed is represented by $00 to $FF with 1 step for 61$\mu$s.
That is, the measured timer value is represented by HEX as it is.

⑤In this mode, no other witch detections are performed during a series of AF set drive, shutter operation and AF reset.

⑥At the occurrence of an operation error during AF set drive, shutter operation or AF reset drive, the adjusting mode is canceled.
(Writing on EEPROM is not performed.)

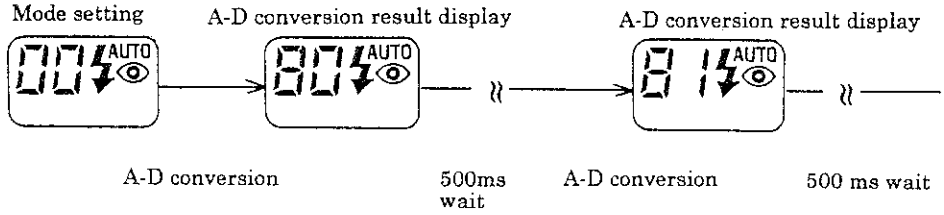
3. Temperature Compensation Value Display Mode

①This mode is set by turning ON the Rewind Switch in the shutter rise time display mode.

②At the beginning of this mode, the LCD display is as follows :

Lighting

③Every 500 ms, the input voltage of P42 (thermistor temperature detector) is A-D converted and displayed on the LCD.



④When the Release Switch is turned ON during 500 ms wait, the shutter is operated at the shutter time equivalent to EV17 ($00 in shutter time code).
Like in the normal camera operation, the shutter operates in the sequence of AF set drive, shutter operation and AF reset drive. The AF set drive position in this case is infinity.

⑤In this mode, no other switch detections are performed during A-D convertion and a series of AF set drive, shutter operation and AF reset.

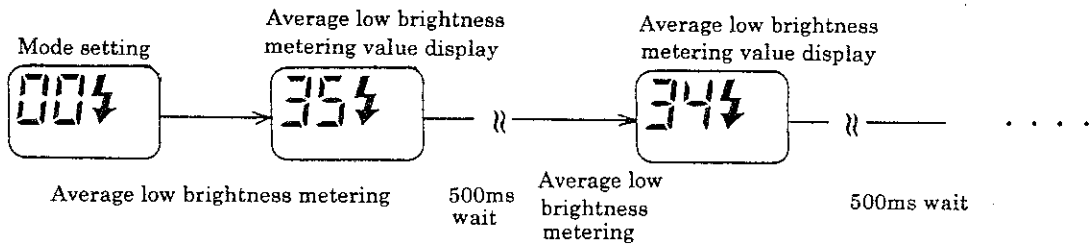
⑥At the occurrence of an operation error during AF set drive, shutter operation or AF reset drive, the adjusting mode is canceled
(Writing on EEPROM is not performed.)

4. Light Metering Data Display Mode

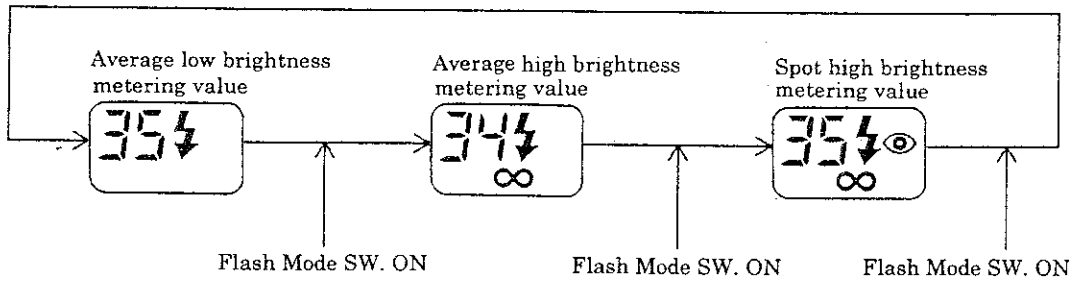
①This mode is set by turning ON the Rewind Switch in the temperature compensation value display mode.

②At the beginning of this mode, the LCD display is as follows :

③Every 500 ms, average light metering is performed and the EV value conversion code for the average light metering value is displayed on the LCD continuously.



④By turning ON the Flash Mode Switch in the state ③ adove,the EV conversion code display can be switched between the average high brightness metering value and the spot high brightness metering value.
The LCD display in the case is as shown below.
After the spot high brightness metering value, the display returns to the average low brightness metering value.


Average low brightness metering value
Average high brightness metering value
Spot high brightness metering value
Flash Mode SW. ON
Flash Mode SW. ON
Flash Mode SW. ON

⑤When the Release Switch is turned ON during 500ms wait, the shutter is operated at the shutter time calculated from the current light metering time. (The shutter time is determined from the average metering value at the average metering value display or from the stop metering value at the spot metering value display.)
Like in the normal camera operation, the shutter operates in the sequence of AF set drive, shutter operation and AF reset drive.
The AF set drive position in this case is infinity.

⑥In this mode, no other switch detections are performed during a series of AF set drive, shutter operation and AF reset.

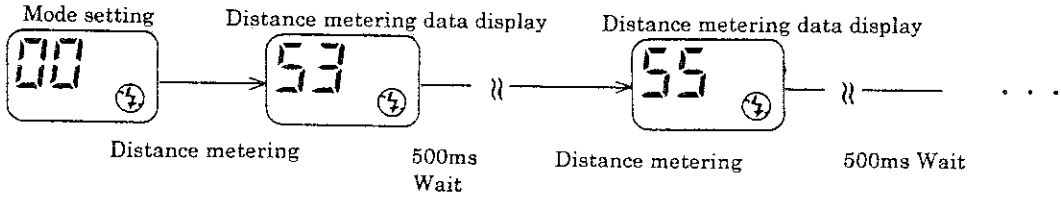
⑦AF At the occurrence of an operation error during AF set drive, shutter operation or reset drive, the adjusting mode is canceled.
(Writing on EEPROM is not performed.)

5. AF Data Display Mode

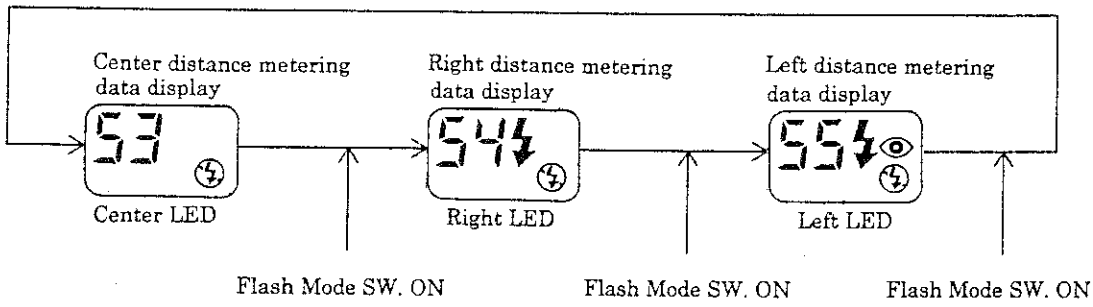
①This mode is set by turning ON the Rewind Switch in the light metering data display mode.

②At the beginning of this mode, the LCD display is as follows :

③Every 500ms, distance metering is performed and the distance metering data from the AF-IC is displayed on the LCD continuously.



④The distance metering result display by selection of the right or left LED is performed by turning ON the Flash mode Switch in the state above.
The display in this case is as shown below.
After the left LED, the display returns to the center LED distance metering result.



⑤At the next turning ON of the Rewind Switch, the mode returns to the adjusting value correction mode.

C-1-5 Adjustment Procedure

Adjust and write the backup data written on EEPROM by the following procedure :

1. Lens infinity position adjustment (Address $26)

Find the real infinity position of the lens and P2 pulse (EEPROM writing address $26).
Measuring instrument : Collimator (F = 193.5mm)
Standard : −2.0 ~ +3.0mm at use of film

Shutter Rise Mode

1) Set film on the camera.
2) Close the Back Cover, blank shots advance.
3) Set the adjusting mode.
4) Turn ON the Rewind Switch once to set the shutter rise mode.
5) Set the camera on the collimator and the Release Button is depressed at all the way. As long as the Release Botton is kept on, the camera advances the lens by the number of pulseequivalent to the adjusting value of P2 pulsed and keeps the shutter fully open.
6) Find the sharp focus position of the collimator image by moving the objective lens of the collimator.
7) Read the scale (Dmm) of the objective helicoid of the collimator and find the deflection △L mm from the infinity position by consulting the list on page C-12.
8) The Travel per lens barrel drive pulse is 0.027mm.
   Therefore, calculate the adjusting value of P2 pulse from

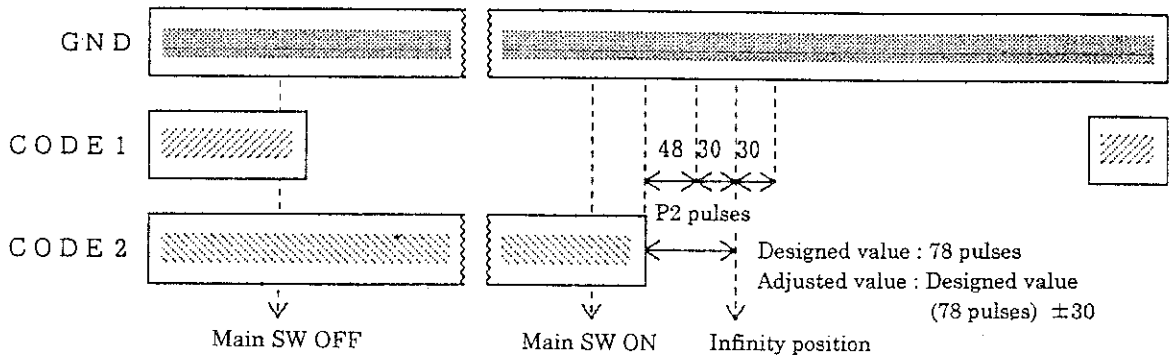
   Adjusting pulse count = △L / 0.027

   To calculate the adjusting pulse count, repeat the above procedure five times and take an average. In doing so, the result is not acceptable if the variation of five times is eight pulses or more.
9) Write the calculated adjusting pulse count at address $26 in the adjusting value correction mode and then turn OFF the Main Switch.
10) Measure the deflection from the infinity position again and make sure that the calculated adjusting pulse count is within ±2 pulses. Upon this, the adjusting is completed.

Notes :

a) Power is being consumed during full opening of the shutter. Therefore, try to minimize the full opening time (max. 3min). (Power is stopped by turning OFF the release.)

Relationship between retract barrel codes and lens position



P2 pulses = Basic designed value 78pulses + Adjusting value (±30 pulses)

Adjusting values are held by eight bits with sighs representing the deflection from the basic designed value "$00" (78).
The basic designed value is held as ROM data.
The adjusting width is within $E2 (−30) to $1E (+30).

Adjusting value	[HEX]	E 2	E 3	·	F E	F F	0 0	0 1	0 2	·	1 D	1 E
	[DEC]	-30	-29	·	-2	-1	0	+1	+2	·	+29	+30
P2 pulses	[HEX]	3 0	3 1	·	4 C	4 D	4 E	4 F	5 0	·	6 B	6 C
	[DEC]	48	49	·	76	77	78	79	80	·	107	108

Example :

① When the compensation value in the camera is 0.

② Read the scale (D mm) of the objective helicoid of the collimator.
D = + 5.0 mm

③ Find the △L mm of D = + 5.0 mm from the table "Difference between film surface and focal plane".
△L mm = 0.1679

④ The adjusting pulse count is
△L mm / 0.027 = 0.1679 / 0.027 = 6 (pulses)

⑤ Correction by +6 pluses is made for the compensation value "0" in the camera.
0 − (+6) = −6
The adjusting values of −6 pulses is represented as $FA in two' s complement from.

⑥ Write $FA at address $26 in the adjusting value correction mode and then turn OFF the Main Switch.

No.	419-01-50-RA3CP01

Difference between film surface and focal plane

D \ f	5 mm	6	6.5	7	8	9	28	30	32	35	38	40
mm 0.1	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0021	0.0024	0.0027	0.0033	0.0039	0.0043
0.2	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0042	0.0028	0.0055	0.0066	0.0077	0.0086
0.3	0.0002	0.0003	0.0003	0.0004	0.0005	0.0007	0.0063	0.0072	0.0082	0.0098	0.0116	0.0128
0.4	0.0003	0.0004	0.0004	0.0005	0.0007	0.0009	0.0084	0.0096	0.0110	0.0131	0.0155	0.0171
0.5	0.0003	0.0005	0.0005	0.0007	0.0009	0.0011	0.0105	0.0120	0.0137	0.0164	0.0193	0.0214
0.6	0.0004	0.0006	0.0007	0.0008	0.0010	0.0013	0.0126	0.0145	0.0185	0.0197	0.0232	0.0257
0.7	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0147	0.0169	0.0192	0.0230	0.0271	0.0300
0.8	0.0005	0.0008	0.0009	0.0011	0.0014	0.0017	0.0168	0.0193	0.0220	0.0263	0.0310	0.0343
0.9	0.0006	0.0009	0.0010	0.0012	0.0015	0.0020	0.0190	0.0217	0.0247	0.0296	0.0349	0.0386
1.0	0.0007	0.0010	0.0011	0.0013	0.0017	0.0022	0.0210	0.0242	0.0275	0.0329	0.0388	0.0430
1.2	0.0008	0.0012	0.0014	0.0016	0.0021	0.0026	0.0253	0.0290	0.0330	0.0395	0.0466	0.0516
1.4	0.0009	0.0014	0.0016	0.0018	0.0024	0.0031	0.0295	0.0339	0.0386	0.0461	0.0544	0.0603
1.6	0.0011	0.0016	0.0018	0.0021	0.0028	0.0035	0.0338	0.0388	0.0441	0.0528	0.0622	0.0689
1.8	0.0012	0.0017	0.0020	0.0024	0.0031	0.0039	0.0380	0.0437	0.0497	0.0594	0.0701	0.0776
2.0	0.0013	0.0019	0.0023	0.0026	0.0035	0.0044	0.0423	0.0486	0.0553	0.0662	0.0779	0.0864
2.2	0.0015	0.0021	0.0025	0.0029	0.0038	0.0048	0.0466	0.0535	0.0608	0.0728	0.0858	0.0951
2.4	0.0016	0.0023	0.0027	0.0032	0.0042	0.0053	0.0509	0.0584	0.0667	0.0795	0.0937	0.1038
2.6	0.0018	0.0025	0.0030	0.0034	0.0045	0.0057	0.0552	0.0633	0.0721	0.0862	0.1016	0.1126
2.8	0.0019	0.0027	0.0032	0.0037	0.0048	0.0061	0.0595	0.0683	0.0777	0.0930	0.1096	0.1214
3.0	0.0020	0.0029	0.0034	0.0040	0.0052	0.0066	0.0638	0.0732	0.0833	0.0997	0.1175	0.1302
3.5	0.0024	0.0034	0.0040	0.0047	0.0061	0.0077	0.0746	0.0857	0.0975	0.1166	0.1375	0.1523
4.0	0.0027	0.0039	0.0046	0.0053	0.0070	0.0088	0.0855	0.0982	0.1117	0.1336	0.1575	0.1745
4.5	0.0031	0.0044	0.0052	0.0060	0.0079	0.0100	0.0965	0.1107	0.1260	0.1507	0.1777	0.1969
5.0	0.0034	0.0049	0.0058	0.0067	0.0088	0.0111	0.1074	0.1234	0.1404	0.1679	0.1979	0.2193
5.5	0.0038	0.0054	0.0064	0.0074	0.0097	0.0122	0.1185	0.1361	0.1548	0.1852	0.2183	0.2419
6.0	0.0041	0.0060	0.0070	0.0081	0.0106	0.0134	0.1296	0.1488	0.1693	0.2026	0.2388	0.2645
6.5	0.0045	0.0065	0.0076	0.0088	0.0115	0.0146	0.1408	0.1617	0.1839	0.2201	0.2594	0.2874
7.0	0.0048	0.0070	0.0082	0.0095	0.0124	0.0157	0.1521	0.1746	0.1986	0.2376	0.2801	0.3104
7.5	0.0052	0.0075	0.0088	0.0102	0.0133	0.0169	0.1634	0.1875	0.2134	0.2553	0.3009	0.3334
8.0	0.0056	0.0080	0.0094	0.0109	0.0143	0.0181	0.1747	0.2006	0.2282	0.2730	0.3218	0.3566
8.5	0.0059	0.0085	0.0100	0.0116	0.0152	0.0192	0.1862	0.2137	0.2431	0.2909	0.3429	0.3799
9.0	0.0063	0.0091	0.0106	0.0124	0.0161	0.0204	0.1976	0.2268	0.2581	0.3088	0.3640	0.4034
9.5	0.0067	0.0096	0.0113	0.0131	0.0171	0.0216	0.2092	0.2401	0.2732	0.3269	0.3853	0.4269
10.0	0.0070	0.0101	0.0119	0.0138	0.0180	0.0228	0.2203	0.2535	0.2884	0.3450	0.4067	0.4506
11.0	0.0078	0.0112	0.0132	0.0153	0.0199	0.0252	0.2442	0.2803	0.3190	0.3816	0.4500	0.4984
12.0	0.0085	0.0123	0.0144	0.0167	0.0219	0.0277	0.2679	0.3075	0.3499	0.4186	0.4934	0.5467
13.0	0.0093	0.0134	0.0157	0.0182	0.0238	0.0301	0.2918	0.3350	0.3811	0.4560	0.5375	0.5955
14.0	0.0101	0.0145	0.0170	0.0198	0.0258	0.0326	0.3160	0.3628	0.4127	0.4938	0.5820	0.6449
15.0	0.0109	0.0156	0.0183	0.0213	0.0278	0.0352	0.3405	0.3909	0.4447	0.5320	0.6271	0.6949
16.0	0.0116	0.0168	0.0197	0.0228	0.0298	0.0377	0.3652	0.4193	0.4770	0.5707	0.6727	0.7454
17.0	0.0124	0.0179	0.0210	0.0244	0.0319	0.0403	0.3902	0.4480	0.5097	0.6098	0.7188	0.7964
18.0	0.0133	0.0191	0.0224	0.0260	0.0339	0.0429	0.4155	0.4770	0.5428	0.6493	0.7654	0.8481
19.0	0.0141	0.0203	0.0238	0.0276	0.0360	0.0456	0.4412	0.5064	0.5762	0.6893	0.8125	0.9003
20.0	0.0149	0.0214	0.0252	0.0295	0.0381	0.0483	0.4671	0.5362	0.6100	0.7298	0.8602	0.9532

D : Travel of objective lens of collimator

f : Focal distance of checking lens

2. Temperature adjustment (Address $27)

The temperature at shutter operation is detected because of the temperature dependence property of the shutter. Shift adjustment, however, must be made to compensate for the variation of the temperature detecting thermistors.
Be sure to make this adjustment before starting AE related adjustments (shutter rise, delay, exposure value adjustment).

Measuring instrument : Thermometer

1) Set the camera to adjusting mode and then turn ON the Rewind Switch twice to set the temperature compensation value display mode.
2) The data on the LCD is the current temperature code value A-D converted from the thermistor.
   (Every 500ms, the measured data is A-D converted and display in HEX.)
3) Measure the temperature (℃) in a place as close to the camera as possible and calculate the shift from the theoretical A-D converted value.

   Adjusting value = Theoretical A-D converted value at current temperature [HEX] − Data on LCD [HEX]

4) Write the adjusting value of calculated shift at address $27 in the adjusting value correction mode and then turn OFF the Main Switch.

Example :
①If the measured room temperature is 20℃, find the theoretical A-D converted value (HEX) for 20℃.
20℃ = $73
②Suppose the data displayed on the LCD in the temperature compensation display mode is "80".
③Find DEC for $73 and $80 from the HEXA Table.
$73 = 115, $80 = 128
④Adjusting value
Adjusting value =115−128=−13 (DEC)

Temperature compensation value display mode

Theoretical A-D converted values

T [℃]	A/D [HEX]
15	65
16	68
17	6B
18	6D
19	70
20	73
21	75
22	78
23	7B
24	7D
25	80
26	82
27	85
28	87
29	8A
30	8D

⑤ Find HEX for −13 from the HEXA Table.
−13 = $F3
⑥ Write $F3 on EEPROM in the adjusting value correction mode.

3. Shutter rise time adjustment (Address $28)

Adjust the voltage (D-A converted output) applied to the shutter so that the shutter rise time (time from pinhole timing to "full-open" timing) will be constant. Make this adjustment in an environment of 10 to 30°C.

1) Set the adjusting mode. In the adjusting value correction mode, make sure that the adjusting value for, shutter D-A converted temperature compensation constant is "00" at address $39 to $3F.

Shutter rise time display mode

2) Set the adjusting value correction mode again by turning ON the Rewind Switch.
Then turn ON the Rewind Switch again to set the shutter rise time display mode.
3) The Release Button is depressed at all the way in this mode, and the camera will drive the shutter at a shutter time of 1 / 60 or faster (shutter is kept open during press of the Release Button). Measure the time from the pinhole timing to the "full-open" timing and display the result on the LCD in HEX.
Output time : $00 (0) ~ $FF (16.320) ms
Minimum resolution : 61 μ s
4) Adjust the displayed time to $5F to $69 (5.795 to 6.405 ms) by changing the voltage adjustment for shutter rise time.
(Center value $64 = 6.1ms)
D-A converted output resolution : 1LSB --------11.7mv
Change in rise time per LSB : 0.2 ± 0.05ms
Let the measured time by T1 and the change in rise time per LSB be T2.
Then adjusting value = (T1 ms − 6.1 ms) / T2.
*The adjusting value is represented in two's complement of 8 bits.

Example :
When measured time is $52 ms
$52 = 82DEC 82 × 61 μ s = 5.002 ms = T1 (5 − 6.1 ms) / 0.2 = −5
This value is represented in two's complement from and $FB is treated as the adjusting value.

Adjusting value (HEX)	E 7	E 8	· ·	F E	F F	0 0	0 1	0 2	· ·	1 7	1 8
D/A Setting value (HEX)	3 0	3 1	· ·	4 7	4 8	4 9	4 A	4 B	· ·	6 0	6 1
D/A Output value (mv)	562	573	· ·	831	842	854	866	878	· ·	1123	1135

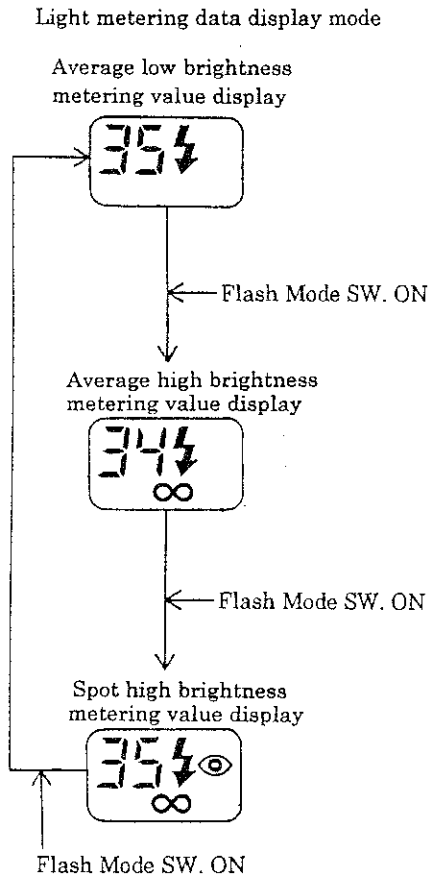
5) Write the calculated adjusting value at address $28 in the adjusting value correction mode and then turn OFF the Main Switch.
6) Repeat the adjustment above and make sure that the shutter rise time is within $5F to $69 (6.1 ± 0.3ms).

4. Light metering adjustment (Address $2A to $2C)

Adjust the light metering value to absorb the variation of the SPDs and integration capacitors. Make this adjustment so that the light metering time is adjusted to the reference value by changing the reference potential for light metering.
Make adjustment for each of average high brightness, average low brightness and spot high brightness.

Measuring instrument : AE multi-tester

1) Set the adjusting mode. In this adjusting value correction mode, set the exposure adjusting value to "00" at address $20.
   The light metering value display data, incorporating the exposure adjusting value, is not displayed correctly if this value is not "00".
2) After that, turn ON the Rewind Switch three times to set the light metering value display mode.
3) Then the camera performs light metering every 500ms displays the average low brightness metering value code on the LCD continuously.
   (This light metering value code is represented at 1/8 EV steps with EV17 as $10.)
4) Set the brightness of the AE multi-tester to EV9.
5) Have the camera face the light source of the AE multi-tester.
   And make adjustment so that the data on the LCD becomes "4F".
   Set the adjusting value correction mode by turning ON the Rewind Switch three times, rewrite the compensation value at address $2A and turn OFF the Main Switch.
   (Make adjustment by changing the adjusting value of the reference voltage for light metering average low brightness.)


Light metering data display mode
Average low brightness metering value display
Flash Mode SW. ON
Average high brightness metering value display
Flash Mode SW. ON
Spot high brightness metering value display
Flash Mode SW. ON

6) Set the adjusting mode. Turn ON the Rewind Switch three times to set the light metering display mode.
7) Have the camera face the light source of the AE multi-tester again and make sure that the data on the LCD is "4F". If it is not "4F", repeat step 5).
8) If "4F" is displayed, set the brightness of the AE multi-tester to EV15.
9) Turn ON the Flash Mode Switch of the camera to display the average high brightness metering value.

10) Have the camera face the light source of the AE multi-tester.
Then make adjustment so that the data on the LCD becomes "20"
Set the adjusting value correction mode by turning ON the Rewind Switch three times, rewrite the compensation value at address $2B and turn OFF the Main Switch.

11) Set the adjusting mode. Turn ON the Rewind Switch three times to set the light metering value display mode.

12) Turn ON the Flash Mode Switch of the camera to display the average high brightness metering value.

13) Have the camera face the light source of the AE multi-tester and make sure that the display on the LCD is "20". If it is not "20", repeat step 10).

14) If "20" is displayed, turn ON the Flash Mode Switch of the camera to display the spot high brightness metering value.

15) With the brightness of AE multi-tester kept at EV15, have the camera face the light source. Then make adjustment so that the data on the LCD becomes "20". Set the adjusting value correction mode by turning ON the Rewind Switch three times, rewrite the compensation value at address $2C and turn OFF the Main Switch.

16) Set the adjusting mode. Turn ON the Rewind Switch three times to set the light metering value display mode.

17) Turn ON the Flash Mode Switch of the camera twice to display the spot high brightness metering value.

18) Have the camera face the light source of the AE multi-tester and make sure that the data on the LCD is "20". If it is not "20", repeat step 15).

Notes :

a) If the brightness of EV9 is not provided by the AE multi-tester, make adjustment so that the data on the LCD becomes "57" at EV8.

b) Although the designed EV conversion code at EV9 is $50, adjust to $4F to reduce the difference at switching between low brightness and high brightness.

	High brightness	Low brightness	When △EV = 0		
△EV value	EV conversion code (EV15)	EV conversion code (EV9)	Reference potential	Adjusting value (Low brightness)	Adjusting value (High brightness)
+ 0.875	$19	$49	EB	58	6B
+ 0.75	1A	4A	D8	45	58
+ 0.625	1B	4B	C5	35	45
+ 0.5	1C	4C	B5	26	35
+ 0.375	1D	4D	A6	18	26
+ 0.25	1E	4E	98	0B	18
+ 0.125	1F	4F	8B	00	0B
± 0	20	50	80	F6	00
− 0.125	21	51	76	EB	F6
− 0.25	22	52	6B	E3	EB
− 0.375	23	53	63	DA	E3
− 0.5	24	54	5A	D3	DA
− 0.625	25	55	53	CC	D3
− 0.75	26	56	4C	C6	CC
− 0.875	27	57	46	C0	C6
− 1	28	58	40	BA	C0

* The light measuring time at EV15 is the same as that at EV9.
  That is, the basic designed value of the reference potential is $80 at each of average low brightness, average high brightness and spot high brightness.

* △EV is the difference from the reference in EV conversion code.

5. Exposure adjustment (Address $2D)

Adjust the final exposure including light metering, shutter and lens by changing the light metering value. The change per step is 1/8 EV (0.125EV).

1) Set the camera to night-scene mode for normal shooting. (Turn ON the Flash Mode Switch three times.)
2) Set the brightness of the AE multi-tester to EV9, release the shutter normally and check the error of exposure value.
3) Set the brightness of the AE multi-tester to EV15, release the shutter normally and check the error of exposure value.
   At this point, use the exposure adjusting value written on EEPROM.
4) Calculate a compensation value so that the error of exposure value becomes within 0.2EV at the two brightnesses.
5) Set the adjusting mode. In the adjusting value correction mode, make adjustment by changing the compensation value at address $2D.
6) Turn OFF the Main Switch for writing.
7) Make sure that the errors of exposure value at EV9, 12 and 15 are within respective specification ranges.

Error △EV of exposure value and corresponding adjusting value

△EV value	Adjusting value
+ 2	$F0
.	.
.	.
+ 0.875	F9
+ 0.75	FA
+ 0.625	FB
+ 0.5	FC
+ 0.375	FD
+ 0.25	FE
+ 0.125	FF
± 0 (Reference value)	00
− 0.125	01
− 0.25	02
− 0.375	03
− 0.5	04
− 0.625	05
− 0.75	06
− 0.875	07
− 1	08
.	.
.	.
− 1.875	0F

Exposure standard

Brightness EV	Allowable Range
LV9	−0.8～+0.8EV
LV12	−0.8～+0.8EV
LV15	−0.9～+1.0EV

(K value = 1.3)

6. Shutter delay adjustment (Address $29)

Adjust the time from trigger timing to shutter time code timing.
Make this adjustment at the same time as exposure adjustment.
1) Set the brightness of the AE multi-tester to EV15, ISO400.
2) Measure the exposure value then. Adjust the Shutter delay value by changing the compensation value at address $29.
3) Repeat 2) until the average of five successive correction values become within −0.2 ~ +0EV.

* Calculate the adjusting value from the change of about 0.15EV per 1LSB.

Adjusting value (HEX)	F1	F2	・ ・	FE	FF	00	01	02	・ ・	0E	0F
Delay setting value (HEX)	01	02		0E	0F	10	11	12		1E	1F
Setting time (μs)	61	122	・ ・	854	915	976	1037	1098	・ ・	1830	1891

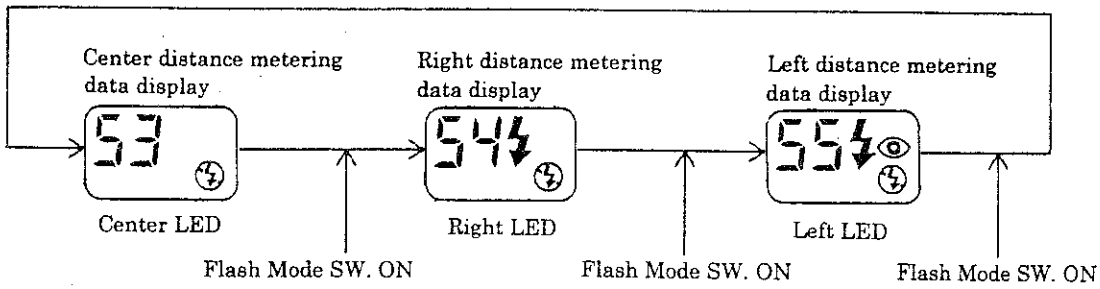
7. AF adjustment (Address $2E to $38)

Each camera has AF pulse data for the camera-to-subject distances of 0.3m, 0.45m, 0.6m, 1m and 3m. Measure the actual AF pulse data of each camera and write the difference between the data and the basic designed value on EEPROM as the shift.

Adjusting tools :
- 18% gray chart (minimum dimensions 395mm × 1200mm) or white paper (same dimensions)
- Measure (capable of measuring up to 3m)
- Tripod

AF data display mode

1) Set the camera to the adjusting mode and then turn ON the Rewind Switch four times to set the AF data display mode.
2) Fix the camera on the tripod.
3) Adjust the distance between the gray chart and the film surface of the camera to 3m, 1m, 0.6m, 0.45m and 0.3m and record the AF pulse data displayed on the LCD for the respective distances.
4) Turn ON the Flash Mode Switch to display the right distance metering data.
5) Adjust the distance between the gray chart and the film surface of the camera to 3m, 1m and 0.6m and record the AF pulse data displayed on the LCD for the respective distance.
6) Turn ON the Flash Mode Switch to display the left distance metering data.
7) Adjust the distance between the gray chart and the film surface of the camera to 3m, 1m and 0.6m and record the AF pulse data displayed on the LCD for the respective distances.

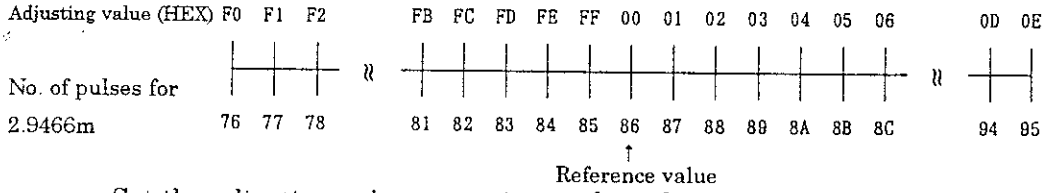


8) Calculate the difference between each AF pulse data measured and the basic designed value.

Contents and reference values at addresses

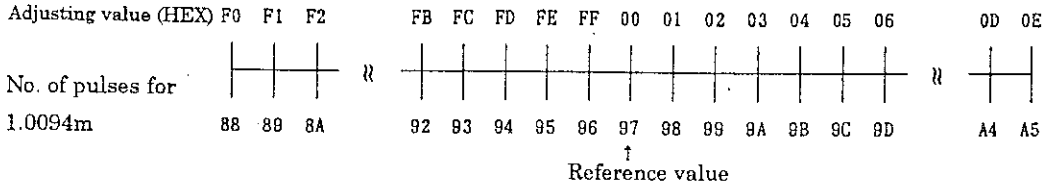
Address	Reference value	Initial value	Content	
$2E	$86	$00	AF pulse data for 2.9466m (Center LED)	− $02
$2F	$97	$00	AF pulse data for 1.0094m (Center LED)	
$30	$A9	$00	AF pulse data for 0.5987m (Center LED)	
$31	$B7	$00	AF pulse data for 0.4519m (Center LED)	
$32	$C9	$00	AF pulse data for 0.3494m (Center LED)	
$33	$4A	$00	AF pulse data for 2.9466m (Right LED)	+ $02
$34	$5A	$00	AF pulse data for 1.0094m (Right LED)	
$35	$6C	$00	AF pulse data for 0.5987m (Right LED)	
$36	$C3	$00	AF pulse data for 2.9466m (Left LED)	+ $02
$37	$D3	$00	AF pulse data for 1.0094m (Left LED)	
$38	$E5	$00	AF pulse data for 0.5987m (Left LED)	

Example 1 : When the AF pulse data for 3m of the center LED is $8A, the data ataddress $2E is $04 ($8A − $86 = $04). $04 − $02 = $02.


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 2.9466m
76 77 78 81 82 83 84 85 86 87 88 89 8A 8B 8C 94 95
Reference value

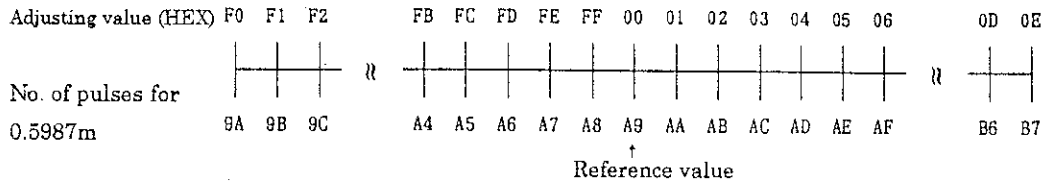
Set the adjusting value correction mode and write the adjusting value of $04 at address $2E.

Example 2 : When the AF pulse data for 1m of the center LED is $9C, the data at address $2F is $05 ($9C − $97 = $05).


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 1.0094m
88 89 8A 92 93 94 95 96 97 98 99 9A 9B 9C 9D A4 A5
Reference value

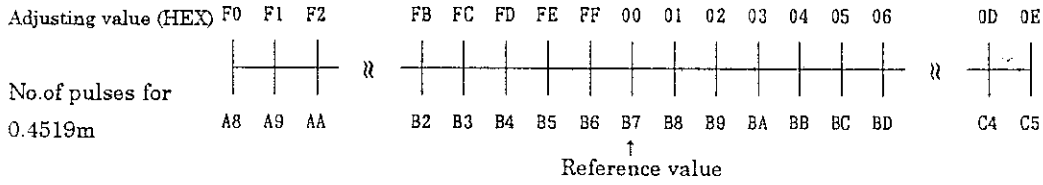
Set the adjusting value correction mode and write the adjusting value of $05 of address $2F.

Example 3 : When the AF pulse data for 0.6m of the center LED is $AF, the data at address $30 is $06 ($AF − $A9 = $06).


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 0.5987m
9A 9B 9C A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF B6 B7
Reference value

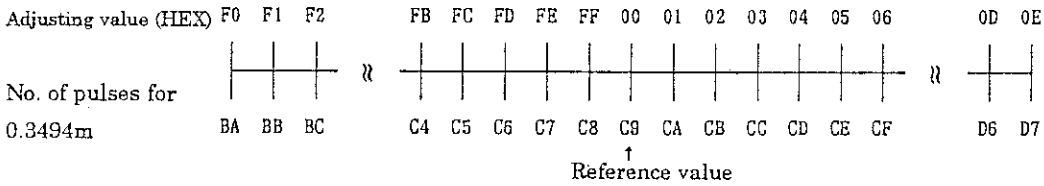
Set the adjusting value correction mode and write the adjusting value of $06 at address $30.

Example 4 : When the AF pulse data for 0.45m of the center LED is $BD, the data at address $31 is $06 ($BD − $B7 = $06).


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No.of pulses for 0.4519m
A8 A9 AA B2 B3 B4 B5 B6 B7 B8 B9 BA BB BC BD C4 C5
Reference value

Set the adjusting value correction mode and write the adjusting value of $06 at address $31.

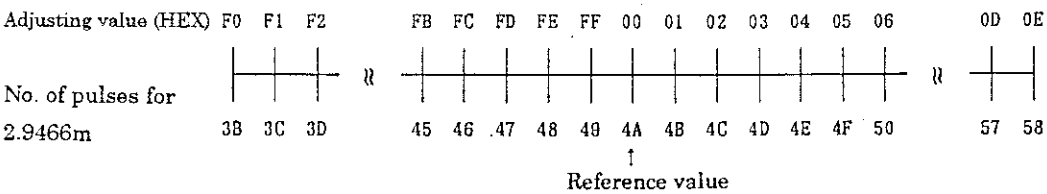
Example 5 : When the AF pulse data for 0.3m of the center LED is $C5, the data at address $32 is $FC ($C5 − $C9 = $FC).


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 0.3494m
BA BB BC C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF D6 D7
Reference value

Set the adjusting value correction node and write the adjusting value of $FC at address $32.

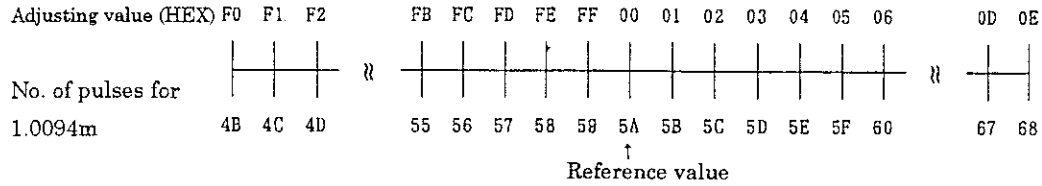
~~Notes: In the adjusting of the right LED (Addresses $33, $34 and $35), please add $78 to the adjusting value respectively.~~

Example 6 : When the AF pulse data for 3m of the right LED is $4C, the data at address $33 is $02 ($4C − $4A = $02).
$78 must be added to the data $02 ~~($02 + $78 = $7A)~~ $02 + $02 = $04


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 2.9466m
3B 3C 3D 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 57 58
Reference value

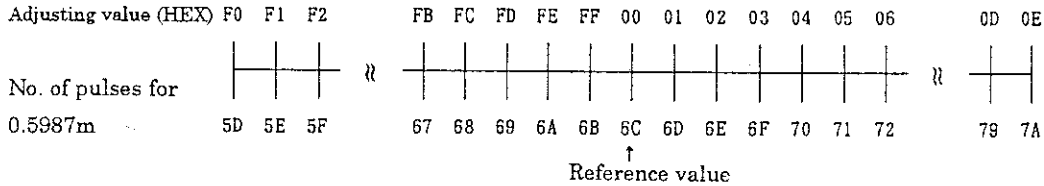
Set the adjusting value correction mode and write the adjusting value of $7A at address $33.

Example 7 : When the AF pulse data for 1m of the right LED is $5F, the data at address $34 is $05 ($5F − $5A = $05).
$78 must be added to the data $05 (~~$05 + $78 = $7D~~)


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 1.0094m
4B 4C 4D 55 56 57 58 59 5A 5B 5C 5D 5E 5F 60 67 68
Reference value

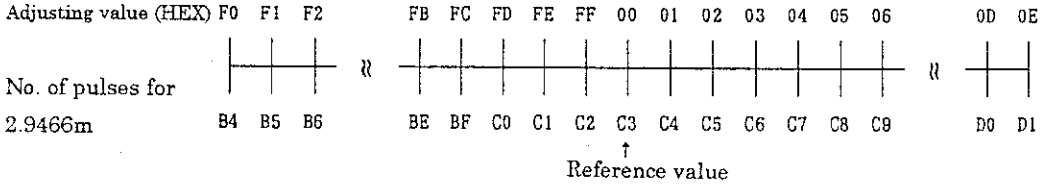
Set the adjusting value correction mode and write the adjusting value of $7D at address $34.

Example 8 : When the AF pulse data for 0.6m of the right LED is $6A, the data at address $35 is $FE ($6A − $6C = −$FE).
$78 must be added to the data $FE (~~$FE + $78 = $76~~)


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 0.5987m
5D 5E 5F 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 79 7A
Reference value

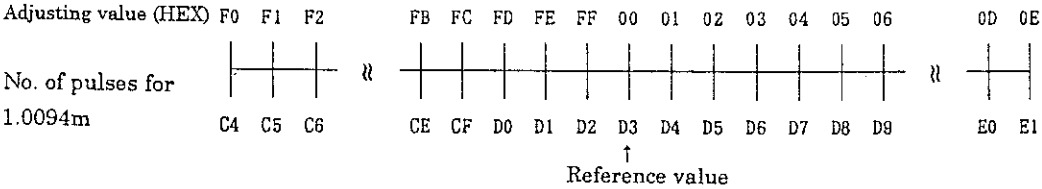
Set the adjusting value correction mode and write the adjusting value of $76 at address $35.

Example 9 : When the AF pulse data for 3m of the left LED is $C2, the data at address $36 is $FF ($C2 − $C3 = $FF). $FF + $02 = $01


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 2.9466m
B4 B5 B6 BE BF C0 C1 C2 C3 C4 C5 C6 C7 C8 C9 D0 D1
Reference value

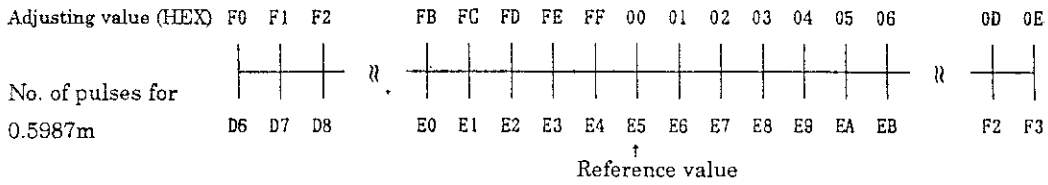
Set the adjusting value correction mode and write the adjusting value of $FF at address $36.

Example 10 : When the AF pulse data for 1m of the left LED is $D6, the data at address $37 is $03 ($D6 − $D3 = $03).


Adjusting value (HEX) F0 F1 F2 FB FC FD FE FF 00 01 02 03 04 05 06 0D 0E
No. of pulses for 1.0094m
C4 C5 C6 CE CF D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 E0 E1
Reference value

Set the adjusting value correction mode and write the adjusting value of $03 at address $37.

Example 11 : When the AF pulse data for 0.6m of the left LED is $EA, the data at address $38 is $05 ($EA − $E5 = $05).


Adjusting value (HEX)
F0 F1 F2
FB FC FD FE FF 00 01 02 03 04 05 06
0D 0E
No. of pulses for 0.5987m
D6 D7 D8
E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 EA EB
F2 F3
Reference value

Set the adjusting value correction mode and write the adjusting value of $05 at address $38.

8. Other adjusting values

(1) Battery check level (Address $24, $25)

This value is not adjustable. Write $0B at address $24 and 00 at $25.

(2) In the adjustable constant value area at address $39 and above, write the initial setting value specified in "Backup Data constituents".

The Main FPC Ass'y prepared as a service part has initial setting values already written. Therefore, do not write any other values on it.

(3) Address currently used (Address $1F)

This value indicates the address of EEPROM storing the film counter value. Which is the first address of the backup data of the film counter value, status information and winding threshold value.
This address is used in such a way that verify check is always performed at storage of these backup data and transition to the next block is performed at the detection of an error. The values to be entered here are multiples of four in the range of $04 to $3C. Do not write any other values.

(4) Film counter value (Address $20)

This value indicates the current film counter value.
Count is possible in the range of $00 (0) to $63 (99). At writing of any other values, error display appears.

(5) Status information (Address $21)

This value indicates the status code representing the current status of the camera.

Status	Status code	Cause of error	Recovery motion
Rewinding	$01	Battery down during rewinding	Rewinding resumed
Rewinding end Blank shots advance failure	$02	Battery down at rewinding end or blank shots advance failure	Rewinding end or blank shots advance failure resumed
Shutter error	$03	Shutter photo coupler signal faulty Battery down during shutter drive	Drive to current Main Switch status position
Main ON / OFF AF set drive error	$04	Retract barrel code, AF photo coupler pulse faulty Battery down during drive	Drive to current Main Switch status position
AF reset drive error	$05	Retract barrel code, AF photo coupler pulse faulty Battery down during drive	Drive to current Main Switch status position then winding by one frame
Winding	$06	Battery down during winding	Another winding by one frame
Normal status	$0F		

* At writing of any values other than the status codes above, processing is made the same way as at a shutter error.

(6) Winding threshold level (Address $22, $23)

This input boundary value is used to check the input of the film perforation signal determined at blank shots advance.
"H" level is set at $22 and "L" level at $23.
Do not any other values than normal values for "H" and "L" levels.
(Previous data is held. Initial value $00)
The level is 11.7mV per LSB.

C-2 OTHERS

C-2-1 Current Consumption

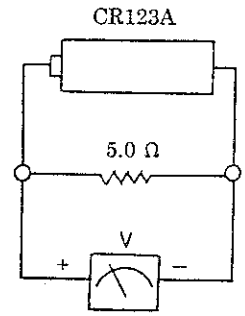
· Stand-by current	20 μ A or less (Main Switch "OFF", Back Cover close)
· Depress the Release Button halfway (check SW ON)	50 μ A or less
· Winding	500mA or less
· Rewinding	500mA or less
· Retract barrel operation	500mA or less
· Stop winding the film	1A or less

* Check current consumption with the voltage regulator set to 3.0V.

C-2-2 Battery Check Voltage

B1 level : Battery mark lighting 2.3V ± 0.1V
B2 level : LCD out 2.2V ± 0.1V
The difference between B1 and B2 must be 0.1V or more.

(Measurement of Battery Voltage)
Load the battery with a resistance of 5.0 Ω and measure the voltage 30ms later.



Note :
a) Do not measure the battery voltage for a long time; otherwise, the battery is consumed.

Backup Data constituents

NAME	ADDORESS (HEX)	Initial Adjusting Value (HEX)	Basic Designed Value (HEX)	b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0
Backup Data Area				
Data Address	1F	04	None	Address currently used
Backup Data (4 bytes)	20	00	None	Film counter
	21	0F	None	Not used Status information
	22	—	None	Winding threshold level, "H" level
	23	—	None	Winding threshold level, "H" level
Adjusting Value Area				
Battery Level1	24	00	99	Battery check B1 level, A-D converted adjusting value
Battery Level2	25	00	75	Battery check B2 level, A-D converted adjusting value
P2 Pulse	26	00	4E	Pulse count adjusting value for infinity position (P2)
Temperature Adjusting Value	27	00	00	Temperature adjusting Value
Shutter D-A Value	28	00	49	Shutter rise time voltage adjusting value (D-A converted value)
Shutter Delay	29	00	00	Shutter delay adjusting value, 8bits with sign, 61 μ s per step, 32 steps
Light metering Adjusting Value	2A	00	80	Light metering adjusting value, Average low brightness reference potential
	2B	00	80	Average high brightness reference potential
	2C	00	80	Spot high brightness reference potential
Exposure Adjusting Value	2D	00	00	Exposure adjusting value, 8bits with sign, 1/8 EV step b0 ~ b5
AF Adjusting Value	2E	00	86	2.9466m AF-IC (Center LED) output pulse count
	2F	00	97	1.0094m AF-IC (Center LED) output pulse count
	30	00	A9	0.5987m AF-IC (Center LED) output pulse count
	31	00	B7	0.4519m AF-IC (Center LED) output pulse count
	32	00	C9	0.3494m AF-IC (Center LED) output pulse count

NAME	ADDORESS (HEX)	Initial Adjusting Value (HEX)	Basic Designed Value (HEX)	b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0
AF Adjusting Value	33	00	4A	2.9466m AF-IC (Right LED) output pulse count
	34	00	5A	1.0094m AF-IC (Right LED) output pulse count
	35	00	6C	0.5987m AF-IC (Right LED) output pulse count
AF Adjusting Value	36	00	C3	2.9466m AF-IC (Left LED) output pulse count
	37	00	D3	1.0094m AF-IC (Left LED) output pulse count
	38	00	E5	0.5987m AF-IC (Left LED) output pulse count
Constant Value Area of Adjusting Possibility				
Shutter D-A Temperature Compensation Constant	39	00	05	Shutter temperature D-A converted compensation value 50℃ ($B9) or above
	3A	00	04	45℃ ($AF) ～ 50℃ ($B9)
	3B	00	03	40℃ ($A5) ～ 45℃ ($AF)
	3C	00	02	35℃ ($99) ～ 40℃ ($A5)
	3D	00	01	30℃ ($8D) ～ 35℃ ($99)
	3E	00	00	10℃ ($58) ～ 30℃ ($8D)
	3F	00	FF	10℃ ($58) or below
FM Constant	40	FD	FC	FM delay adjusting value 8bits with sign, 122 μ s per step, 16 steps
Multi Constant	41	00	43	Multi distance metering allowable range, 0.7m lens drive pulse count
	42	00	0B	Multi distance metering allowable range, 4.0m lens drive pulse count
Multi Constant	43	00	08	Main subject judge pulse (comparison between center data and closest area data)
Charge Level Constant	44	04	A4	Flash charge level (completion voltage) A-D converted value

NAME	ADDORESS (HEX)	Initial Adjusting Value (HEX)	Basic Designed Value (HEX)	b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0
Blank Shots Advance / Winding Constant	45	00	F6	Reversing brake time at blank shots advance
	46	00	FC	Delay time from 8-pulse detection to reversing brake 1
	47	00	F9	Delay time from 8-pulse detection to reversing brake 2
AF Set Pulse Drive Constant	48	02	E0	Motor OFF time of pulse drive at AF set drive
	49	03	02	Reversing brake time at AF set drive, 1ms per step
AF Reset / Main ON	4A	05	0A	Reversing brake time at AF reset / Main ON drive, 1ms per step
AF Set Constant	4B	1E	30	Pulse drive start remaining pulses at AF set drive
Automatic Adjustment Area				
	4C	00		* This area is not used. Do not change the data, however.
	4D	00		
	4E	00		
	4F	00		
	50	00		
	51	00		
	52	00		
	53	00		
	54	00		
	55	00		
	56	00		
	57	00		

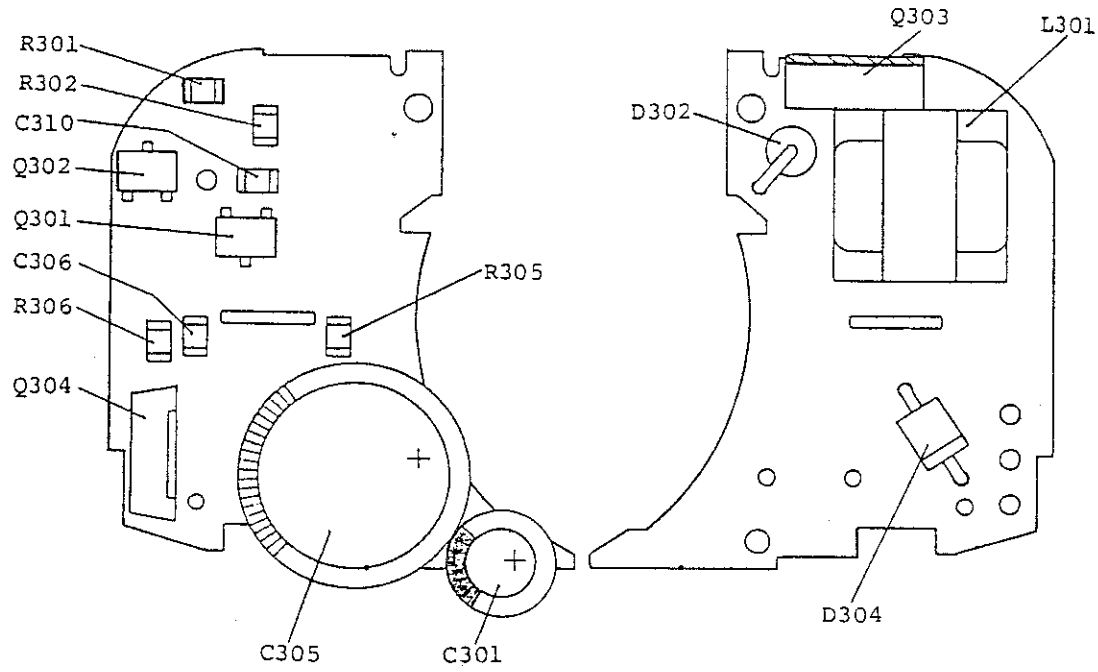
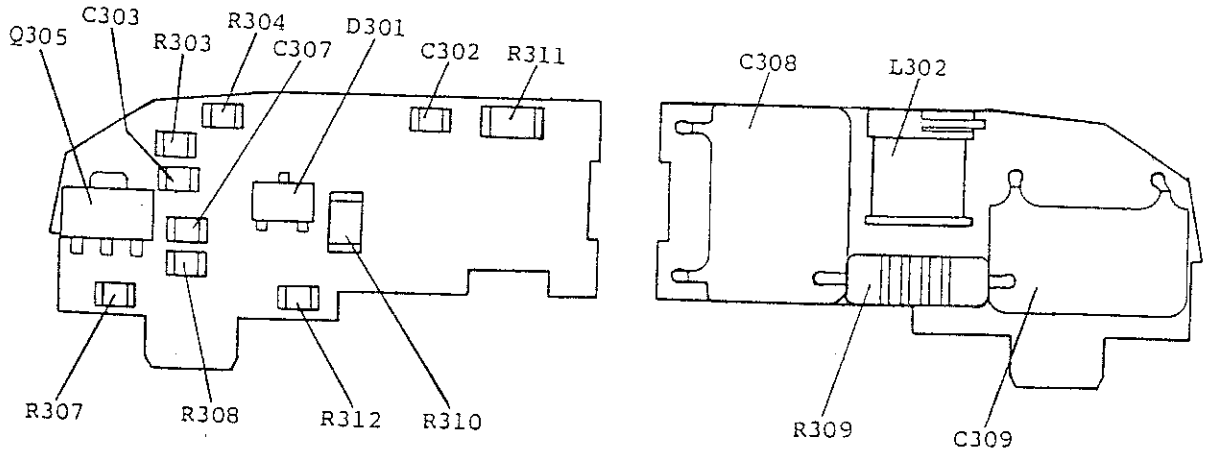
HEXA TABLE

DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX
1	01	36	24	71	47	106	6A	141	8D	176	B0	211	D3	246	F6
2	02	37	25	72	48	107	6B	142	8E	177	B1	212	D4	247	F7
3	03	38	26	73	49	108	6C	143	8F	178	B2	213	D5	248	F8
4	04	39	27	74	4A	109	6D	144	90	179	B3	214	D6	249	F9
5	05	40	28	75	4B	110	6E	145	91	180	B4	215	D7	250	FA
6	06	41	29	76	4C	111	6F	146	92	181	B5	216	D8	251	FB
7	07	42	2A	77	4D	112	70	147	93	182	B6	217	D9	252	FC
8	08	43	2B	78	4E	113	71	148	94	183	B7	218	DA	253	FD
9	09	44	2C	79	4F	114	72	149	95	184	B8	219	DB	254	FE
10	0A	45	2D	80	50	115	73	150	96	185	B9	220	DC	255	FF
11	0B	46	2E	81	51	116	74	151	97	186	BA	221	DD		
12	0C	47	2F	82	52	117	75	152	98	187	BB	222	DE		
13	0D	48	30	83	53	118	76	153	99	188	BC	223	DF		
14	0E	49	31	84	54	119	77	154	9A	189	BD	224	E0		
15	0F	50	32	85	55	120	78	155	9B	190	BE	225	E1		
16	10	51	33	86	56	121	79	156	9C	191	BF	226	E2		
17	11	52	34	87	57	122	7A	157	9D	192	C0	227	E3		
18	12	53	35	88	58	123	7B	158	9E	193	C1	228	E4		
19	13	54	36	89	59	124	7C	159	9F	194	C2	229	E5		
20	14	55	37	90	5A	125	7D	160	A0	195	C3	230	E6		
21	15	56	38	91	5B	126	7E	161	A1	196	C4	231	E7		
22	16	57	39	92	5C	127	7F	162	A2	197	C5	232	E8		
23	17	58	3A	93	5D	128	80	163	A3	198	C6	233	E9		
24	18	59	3B	94	5E	129	81	164	A4	199	C7	234	EA		
25	19	60	3C	95	5F	130	82	165	A5	200	C8	235	EB		
26	1A	61	3D	96	60	131	83	166	A6	201	C9	236	EC		
27	1B	62	3E	97	61	132	84	167	A7	202	CA	237	ED		
28	1C	63	3F	98	62	133	85	168	A8	203	CB	238	EE		
29	1D	64	40	99	63	134	86	169	A9	204	CC	239	EF		
30	1E	65	41	100	64	135	87	170	AA	205	CD	240	F0		
31	1F	66	42	101	65	136	88	171	AB	206	CE	241	F1		
32	20	67	43	102	66	137	89	172	AC	207	CF	242	F2		
33	21	68	44	103	67	138	8A	173	AD	208	D0	243	F3		
34	22	69	45	104	68	139	8B	174	AE	209	D1	244	F4		
35	23	70	46	105	69	140	8C	175	AF	210	D2	245	F5		

C-3 ELECTRIC PARTS MOUNTING DRAWING

Electric Parts on Flash Board Ass'y

Flash Board (1)



Flash Board (2)